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THE EARTH—ITS THIRD MOTION

BY

MARSHAL WHEELER.

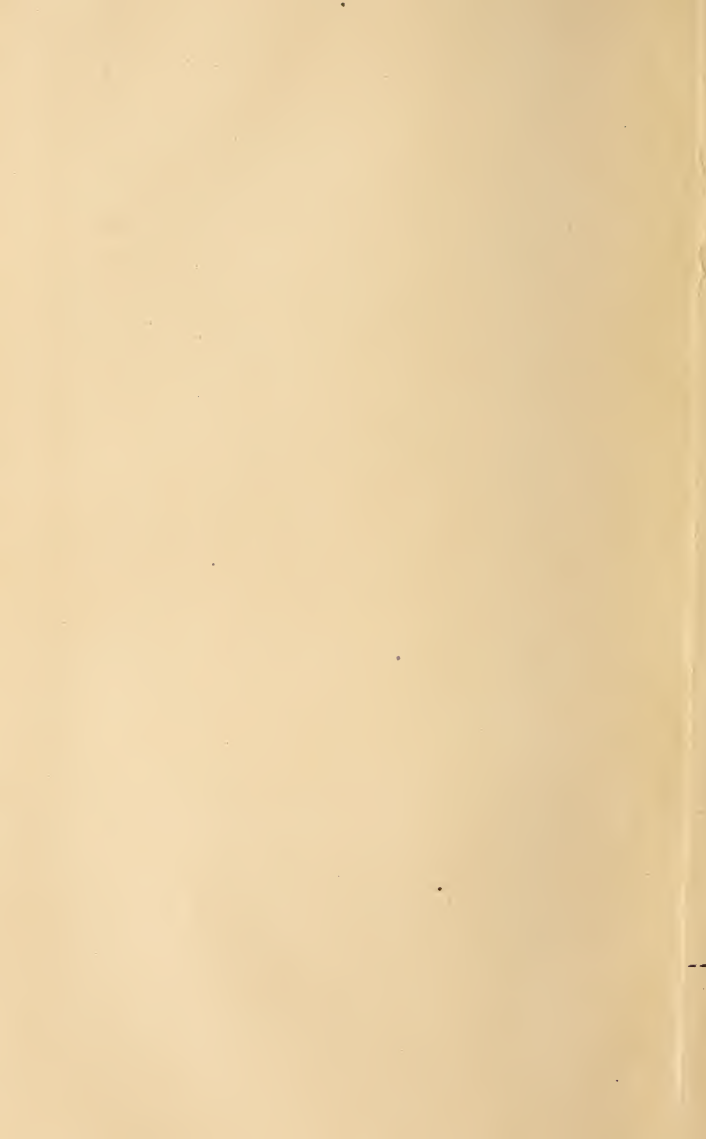
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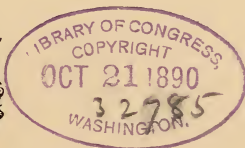
THE EARTH--ITS THIRD MOTION,

A NEW THEORY,

—BY—

MARSHAL WHEELER.

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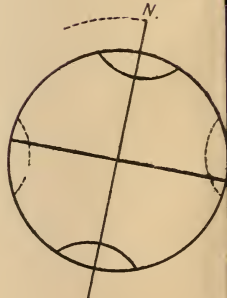
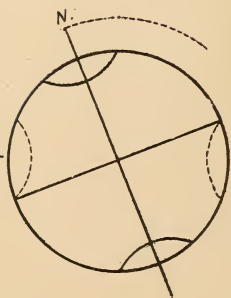
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Patent Applied For



N. Meridian.

A.T. 1. X. 08

MEMORANDUM

Faint, illegible text, likely a memorandum or report, covering several paragraphs of text.

THE GLACIAL EPOCH

The Sun.



Torrid Meridian.



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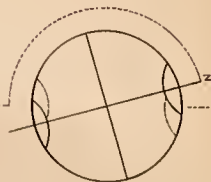
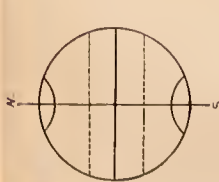
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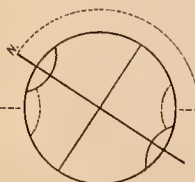


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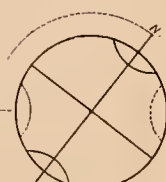
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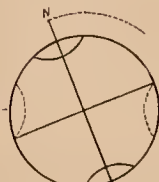
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INTRODUCTORY.

It has been the usual fate of nearly all new discoveries, particularly in Astronomical and Geological science, to be met first, with incredulity: second, with distrust: third, with opposition; fourth, with investigation; and fifth, with adoption. Were my discovery of the Earth's third motion to fail of this experience, I should, indeed, be surprised, and, at the same time, yield a credit to the civilization of the age beyond my present anticipation; for such seems to be the constitution of human nature that where the efforts of a life-time have been made in the pursuit of any particular science, without any very marked results, the advent of a non-professional upon the scene with the prize in grasp, impinges most seriously on the patience of the loser. And yet there are noble natures in the world who occupy a higher conditional plane of life,—to whom truth is priceless from any source, and who welcome with hearty accord the wandering stranger knocking at their gates.

To such I come with my new theory, and only ask for it a fair and patient investigation proportionate with its importance.

In the few succeeding pages of this little pamphlet I have given a succession of brief hints which I hope may aid in the investigation.

In my investigations I have steered entirely clear of all authorities, secular or religious, and taken all of my views from an independent and, I trust, the purely scientific

all candor, hoping that you will cause scientific investigation to be made to determine, so far as possible, the truth, or falsity, of the following propositions embodying my idea, viz :

1st. That the Earth is subject to a periodical third motion.

2nd. That said third motion consists in the Earth's turning upon its own center in a direction at right angles with the planes of its two known motions.

3rd. That said third motion requires the lapse of ages to produce it.

4th. That said third motion may occur with a certain degree of suddenness.

5th. That the momentum of the Earth will cause an oscillating motion, alternating in the direct and reverse direction of its central turning, which will gradually die away and cease altogether during a certain period.

6th. That the Earth will come to a rest at ninety degrees from its starting point, reversing the present position of the poles and the equator.

7th. That after said third motion is fully accomplished the Earth's revolution on its new axis will be rhythmical, and its orbital path serpentine in a direction to and from the sun, until it shall have assumed its present form again in obedience to the law of centrifugal force.

8th. That the Earth's third motion will be caused by the encircling magnetic currents now controlling it, whose northern vortex (magnetic north) is moving westward at the rate of about four minutes of a degree per year.

9th. And that said third motion of the Earth, and the action of its controlling power, is in accordance with the universal rhythmical law governing the universes and all their entities.

That said third motion has occurred during comparatively recent ages, is indicated by those traces of glacial

action to be found in certain portions of the middle zones, which must have occupied a position where the direct rays of the sun could not reach them in order to form vast fields of ice, and further, in the existence of certain flora and fauna in the Arctic regions, which could only have been produced in a temperate or torrid climate. The fact of these indications remaining so plain to-day, notwithstanding the destructive action of the elements, supplemented by the obliterating hand of man for hundreds and thousands of years, gives rise to the impression above expressed.

That this third motion of the Earth has been of repeated occurrence, during the lapse of ages unnumbered, is evidenced by the finding, at certain distances below its surface, different layers of water-worn gravel, marine shells, etc., in both the American and European continents.

That the ancients, of a later period, must have possessed a legendary knowledge of the most recent recurrence of the Earth's third motion, is evidenced from the Noahan account of the Old Testament. How much was lost of this awful history, through the destruction of the Alexandrian library, the world can never know. And, later on, this same knowledge may have caused the building of the pyramids, to stand as a perpetual assertion that the existence of the race of man antedates the awful shock of a reversed world, for it hardly seems probable that they should be but the monuments of human vanity.

Whether the facts that the Earth is incessantly agitated, by seismic action, all over its known surface and is never wholly at rest, and that the continents of the world are rising in some parts and falling in others—that of the North American to be measured by feet since its settlement by the whites—is an indication that it is not yet fully settled to solidity since its last central turn, or whether these are indications that it is now approaching another of

its periodical changes, or whether the whole is the result of other causes, is a question yet to be decided.

The acceptance and adoption of this new theory concerning the motions of the Earth, will lend a coloring of scientific truth, independent of religious belief, to the biblical account of the flood; it will also account for the presence, at the tops of the highest mountains, of marine shells, etc., and for the overwhelming and burial of vast forests, and of myriads of animate marine life, beneath the present surface of the Earth, which, by chemical action, has been transformed into various kinds of coal in exhaustless quantities, and into great sand-rock reservoirs of petroleum; and it will also explain the present and former existence of volcanoes, caused by the enormous-heat-creating attrition of great portions of the broken Earth grinding together, in consequence of the transference, with sudden violence, of the weight of oceans from one part of its surface to another.

When it is understood that, upon a recurrence of said third motion, every nation and kingdom of the globe will be swept out of existence, to remain in that desolate condition then for ages to come, and that, at best, but a small remnant of the human family will be left in possession of the new Earth, it would seem of the highest importance to know of the accuracy of the propositions given above. If they should prove true, the whole world should be informed of the fact, and means taken to forever perpetuate that knowledge, so that, when that dread event transpires mankind should not lapse again into prehistoric barbarism, but, instead, the rhythm of man's existence be raised to a higher plane of action.

Respectfully,

MARSHAL WHEELER.

EUGENE, Oregon, U. S. A., June, 1889.

ADDITIONAL REMARKS.

I do not look upon this newly-discovered motion of the Earth as at all singular or extraordinary. No two planets of the solar system are alike in size, form, or rate of motion: their orbits are different in size, shape and pitch. Their satellites differ in respective numbers, and the orbits of these differ not only from each other, but from those of their several controlling planets.

For aught that is known, other planets than the Earth may be subject to a third motion,—even the Sun itself.

In common with the whole solar system the Earth has, as is well known, a fourth motion toward the constellation of Hercules, in an orbit vast beyond conception, going 150 millions of miles per year, traversing the boundless immensity of the fathomless profound. But this fact is seldom mentioned when treating of the Earth. What influence this change of position among the universes can have upon the Earth is, at best, but conjectural. We know that the law of ceaseless change is universal in its action, and, consequently, the constellation of Hercules may not be in existence to-day, as it was ages upon ages ago, when the light started upon its journey from those blazing suns which we now see.

In our consideration of influences reaching the Earth from the fixed stars, we have to take into account the amazing distances traversed. For instance, the light of the nebula of Orion has taken 60,000 years to reach this Earth, though light travels at the rate of 185,000 miles

per second, and the North Star (Polaris) is so far distant that no parallax can be obtained at the extremities of a base 200,000,000 of miles long. And yet, however weak the influences may be, coming from the astral regions, it is unquestionable that they possess a certain potency over the Earth, for it is to be remembered that there is immeasurably more friction caused by the weight of a cambric needle, revolving upon its own point, than by the whole of our vast globe in all its revolutions, if the teachings of modern science are not in error. If not counteracted by other influences, the pressure of a feather would turn the world over. It may be, therefore, that the central turning of the Earth will be accomplished by a conjunction of the astral and local forces, when the solar system shall have reached a certain point in its orbit.

It must not be overlooked in this connection, however, that the moon also exercises a very powerful local influence upon the Earth, causing its north pole to oscillate to and fro as it revolves in its path, and that the Earth's orbit also has an oscillating motion, changing from year to year. The sun's diameter is 850,000 miles; the earth's diameter is, say, 8,000 miles; owing to this oscillating movement of the Earth's orbit, there may come a time when said oscillation will carry the Earth so near to a lateral limb of the sun as to overbalance it and thus cause the central turning.

There are other influences which may be brought to bear, such as polarization of the globe to such an extent as to render one pole positive and the other negative to the sun's attraction. In such case the Earth will be brought to rest with the attracted pole toward the sun, thus accomplishing a ninety degree revolution, and its first diurnal revolutions maintained by alternate attraction and repulsion until sufficient remagnetization will permit its motion to be maintained by induction of the encircling currents.

The knowledge that the Earth has turned once upon its

center discloses the existence of a law which has caused it. The law, being imperishable, will repeat itself.

It may be well to further remark in this connection, that the adoption of this theory of the Earth's motion renders unnecessary the adoption of a theory that the interior of the Earth is a molten mass, covered on its exterior by an exceedingly thin shell or crust, the rising or falling of which is necessary to freeze or thaw certain portions of the Earth, to create a climate which shall enable the average investigator to successfully account for the existence of certain flora and fauna in regions impossible. It will also disabuse the ordinary mind of the impression that volcanoes are but chimney flues, existing to relieve the Earth's interior cauldron of all extra gas, smoke, etc. It will also render a reasonable solution of the geologist's "Lost Record" problem,—a time really when the whole Earth—not its crust alone—was oscillating or swaying to fro under the influence of momentum caused by its central turning. This problem is sometimes called the "Lost Interval," and sometimes the "Lost Period." There is unmistakable evidence from the geologist's standpoint of the recurrence of these "periods" at four different times, and strong indications of many more. A further delving into the bowels of this solid Earth would doubtless reveal other "periods," *ad infinitum*, to mark its central motions through the ages past, and to stand as predictions of what may be expected to come in future ages forever.

It is small wonder, therefore, that under the repeated action of this great law, vast cities should be submerged at one time, only to reappear at another, in the form of ancient massive ruins half buried in the ocean debris of the ages, and that all knowledge of their former inhabitants should have perished. So suddenly did this awful calamity overtake the ancient copper miners of the Lake Superior region, that they left their tools behind them and fled before the inflowing oceans. All there is left to-day,

of the prehistoric race of mound builders who once inhabited this continent, is their poor melancholy graves, the silent witnesses of their occupants' former existence.

Artesian wells, sunk to great depths in different parts of the world, have betrayed some of the hidden secrets of the repeated central turnings of the Earth, by piercing deposit after deposit, at different depths, of what was once the ocean bed. One put down in East Portland passed through five different layers in 1800 feet.

FORMER POSITION OF THE POLES AND EQUATOR.

From the best that can be learned regarding the position of the poles and the equator, previous to the most recent central turn of the Earth, it is probable that the axis of the Earth passed through at the points located at 104° and at 284° longitude east from Greenwich; and the former equator of the earth bisected the present one at the points indicated at 14° and at 194° east from Greenwich.

The reasons for the foregoing assertions are, that the longest equatorial diameter of the earth is through a point 14° east from Greenwich; and the shortest at 104° , the difference being two miles, giving the Earth formerly somewhat of its present form.

The former 104° pole was located in the south end of the Malayan sea, at its junction with the straits of Malagoa and Billiton, bounded by Malaya on the north, Sumatra on the west and South, and Borneo on the east. The frigid zone surrounding this pole included the southern part of China, one-half of Birmah, a small fraction of Hindoo-stan, one-half the island of Ceylon, touched the northwest corner of Australia, and took one-half of Luzon Island. It also included the whole of Hainan Island; the countries of Anam, Siam and Malaya; the islands of Sumatra, Java, Borneo, Celebes, Mindanao, beside a great number of smaller islands.

The former 284° pole was located in Ecuador, on the west coast of South America, about two and a half degrees

east of Quito, the capital of the country. The frigid zone surrounding this pole included one-half of Yucatan, nearly the whole of Central America, three-quarters of Bolivia, all of the northwest part of Brazil—including the Amazon River.—nearly all of Guiana. It also included all of the West India islands, Panama, United States of Colombia, Ecuador, Peru and Venezuela, beside some islands of the Pacific Ocean.

According to the foregoing, the meridian of the former equator must have bisected Spitzbergen Island in the Arctic Ocean; thence south through the Arctic Ocean, Norway, Sweden, the Baltic Sea, Prussia, Austria, Italy, Sicily, the Mediterranean Sea, Tripoli, Fezzan, along the eastern side of the great desert of Sahara, through Lake Tsad, Africa, along the west coast of Lower Guinea and Africa, into the South Atlantic Ocean near Walvish Bay, and thence through said ocean and the Antarctic Ocean, to the South Pole; and thence north through the Antarctic and South Pacific Ocean to near the eastern shore of the Island of Danger; thence through the North Pacific Ocean to the extreme southwest point of the territory of Alaska, cutting off the Aleutian Isles on the west; thence through the Sea of Kamtschatka, along the west shore of Alaska, and east of Asiatic Russia, to Cape Prince of Wales, Alaska; thence north through Behring's Straits and the Arctic Ocean to the North Pole, and thence south, through the Arctic Ocean, to Spitzbergen Island. The tropical belt (of which this equatorial meridian is the middle division) included on the east, all of the northwestern portion of North America lying west of the Great Slave Lake, all lying north of Hudson's Bay, and included nearly the whole of Greenland, and all of Iceland. On the west it included all of northern Russian Asia. On the opposite side of the globe the entire width of this tropical belt included the British islands and nearly all of Europe and Africa. The remainder of the countries of the Earth occupied a tem-

perate climate, excepting, of course, the present two poles and frigid zones, which at that time formed a part of the torrid zones of the equator.

In further confirmation of the accuracy of my location of the former equator just described, it may be remarked in this connection, that wherever land is to be found in or near the frigid zone of the north (where the former torrid zone intersected said present frigid zone), there are to be found to-day the remains of elephants, mastodons and other animals which could only have been produced and existed in a tropical region, and this assertion is also true of certain kinds of vegetation found there.

To trace still further said torrid zone, I quote from Professor Joseph Le Conte's Geology:

“Of the present flora of Great Britain about one-thirty-fifth are Ferns, and none of these Tree-ferns. Of the Coal flora of Great Britain about one-half were Ferns, and many of these Tree-ferns. At present in all Europe there are not more than sixty known species of Ferns; in European Coal-measures there are nearly 350 species, and these are certainly but a fraction of the actual number then existing. That this indicates a tropical climate is shown by the fact that out of 1,500 species of living Ferns known twenty years ago, 1,200, or four-fifths, were tropical species. The number of known living Ferns is now about 3,000, but the proportion of tropical species is still probably the same. Even in the tropics, however, the proportion of Ferns is far less than in Great Britain during the Coal period. Again, Tree-ferns, arborescent Lycopods, Cycads, and Araucarian Conifers, are now wholly confined to tropical or sub-tropical regions. The prevalence of these tropical families and their immense size, compared with their cogeners of the present day, would seem to indicate not only tropical but *ultra-tropical* conditions. And these conditions prevailed not only in the United States and Europe, but northward to 75°

“north latitude; for in *Mellville Island* have been found coal strata containing *Tree-ferns, gigantic Lycopods, Calamites, etc.* [The italics are all Prof. Le Conte's.]

In this way has the torrid zone recorded its presence formerly in those localities, and this zone could never have occupied those positions without the central turning of the Earth.

I must here confess that I have small faith in those theories which make a baby of the Earth, wrap it in specially prepared blankets of impossible texture and tuck it up so snug that, without the sun's assistance, or any special amount of interior heat, the little fellow will become so hot at its extremities as to thaw the vast mountains and fields of polar ice, and produce an “*ultra-tropical*” climate where “*Tree-ferns and gigantic Lycopods*” will grow.

In further confirmation of the accuracy of my location of the former position of the poles, I will state that, according to Le Conte, “it has been estimated that, in the archipelago about Borneo alone, there are 900 volcanoes.” Also, that there are “groups” of volcanoes in the West Indian islands. As these two localities were formerly $26\frac{1}{2}$ miles nearer together than any other two localities on opposite sides of the globe, upon the central turning of the Earth, there was much more to be thrown out, by centrifugal force, at those two localities than at any other point on the globe. Consequently there was an enormous heat-creating attrition there, resulting in hundreds of volcanoes grouped together in those localities.

Of course there was a like contraction of the former equator, on opposite sides, down to the position of the present poles. Here would arise more heat-creating attrition by this centripetal action, and the creation of more enormous volcanoes, and they are standing to-day in and about the frigid zones as proof.

And of course these great expansions and contractions of opposite extremities of the globe, could not occur with-

out affecting its intermediate parts. According to Le Conte, "the most remarkable linear series of volcanoes is that which belts the Pacific coast. Commencing with the Fuegian volcanoes it runs along the whole extent of the Andes, then along the Cordilleras of Mexico, the Rocky Mountains, then along the Aleutian chain of islands, Kamtschatka, the Kurile Islands, Japan Islands, Philippines, New Guinea, New Zealand, to the Antarctic volcanoes, Mounts Erebus and Terror, thence back by Deception Island to Fuegia again, thus completely encircling the globe. Volcanoes are generally formed in comparatively recent strata."

It would seem from the foregoing that the "linear series of volcanoes" simply indicates the line of greatest weakness around the globe, and, consequently, the location where there was the greatest rupture of the Earth in changing its form. The Professor, in writing of this peculiarity, says it seems "as if connected with a great fissure of the Earth's crust," and this belt line of volcanoes is bisected on opposite sides by the pronounced aggregation of volcanoes, indicating the former position of the Earth's poles.

The interconnecting chains of mountains also show the lines of greatest fracture, consequent upon said central turning, and also prove, in a general way, that the Earth has no universal crust, because the rocks composing said mountains turn out, instead of turning in, under compression. That there are vast fissures pervading the interior of the Earth in every conceivable direction is doubtless true, and the occasional collapse of the surface, in here and there a locality, is a necessary consequence in filling up a cavity beneath. But for all astronomical purposes the Earth may be considered as solid.

Apropos to the preceding it may be also stated that there is doubtless great quantities of gas pervading those fissures, some of which, coming in contact with a live volcano, closed at its outlet, would expand and, by the assistance of centrifugal force, create an occasional earthquake.

FORMER POSITION OF THE OCEANS.

Along the Pacific coast the former water line of the ocean is plainly visible high up on the Cascade and the Rocky Mountains,—near Salt Lake City more than 6,200 feet above the level of the sea. There are various marine deposits also, occupying lower positions, which indicate a portion of its former bed. From such, and other well known signs, located in different parts of both hemispheres, much may be learned regarding the former encroachments of the seas upon what is now dry land. According to Professor Joseph Le Conte there was a time, during the Cretaceous Period, when “the *Atlantic shore-line* in all the northern portion of the continent was farther *out or east* than now, for the Cretaceous of this part is all now covered by the sea. From New Jersey southward the shore-line was then farther *in or west* than now. From Maryland to Georgia the shore-line, though farther *in* than now, was farther *out* than during the Tertiary, as the Cretaceous is covered by the later deposits. The *Gulf shore-line* was much more extended both northward and westward than either now or in Tertiary times. From the Gulf there extended northwestward an immensely *wide sea*, covering the Plains region and the Rocky Mountain region as far westward as the Wahsatch range, and dividing the continents into two continents, an eastern or Appalachian, and a western or Basin region continent. Prob-

ably also this sea connected across the region of Mexico with the Pacific, thus dividing the western continent into two, a northern and a southern. The Pacific Ocean at that time washed against the foot-hills of the Sierra range." Upon a recurrence of the Earth's third motion the seas are quite likely to reoccupy their old position again.

But as to the land which was bare, previous to the Earth's last central turn, the most that can probably be learned concerning it, may be through some calculations of the effects produced by the action of centrifugal force on the waters of the globe, under the changed conditions. The proportion of land to water was probably the same then as now.

FORMER GLACIERS.

The traces of glacial action on both hemispheres, in places remote from regions of ice, and at elevations which would seem to forbid its accumulation, is plainly accounted for under the action of the new theory. In obedience to the force of momentum the first action of the Earth upon its central turning is reciprocal,—a swaying to and fro upon its own center. This process is continued for a greater or lesser period of time, and being necessarily slow in so large a mass as the Earth, gives time for immense bodies of ice to form from the water temporarily thrown upon the Earth's surface, while that surface is turned from the sun. Upon the gradual settling of the Earth to its normal position this ice would slowly melt and slide down all declivities underlying the frozen masses, carrying all manner of loose debris with it. In after time, when the Earth had ceased its swaying motion, the polished mountains, ploughed ravines and scattered boulders everywhere would be all there was left to tell the tale, save here and there one fathered by the higher mountain peaks.

If the Earth, in common with the rest of the solar system, and all the other universes, be considered one of the permanent existences of eternity, it must always have occupied the same relative position in said system, and this theory of glacial action stands as proof of the third motion, for in no other probable way, known to man, could such action be accomplished. In confirmation of the above

suggestion it may be remarked that, as a principle, The Eternal should express itself in the Eternally Permanent as much, or more so, as The Creative in The Temporary,—the former in always being, and the latter in rhythmical appearance. Under this ruling man has always had a rhythmical existence on the Earth, and always will, if no worse fate betides him in the future than has in the past. That his physical existence cannot be traced back beyond a comparatively recent period only proves the annihilating effect produced upon his physical body by the repeated central turnings of the Earth previously. And what is true of man, is also true of animals, only the latter have proved to be more enduring by nature.

If, on the other hand, the Earth originated from absolute nothingness, its origin was unnatural, and it must have been a long time in starting without a germ and in growing to its present robust proportions, and in getting into harmony with the rest of the solar system. Under such circumstances nothing short of a supernatural Revelation could give an account of the glacial periods of this Earth, and that would be beyond any finite comprehension.

It may be that mankind, standing among and witnessing the marvellous results of the productive forces of nature, as manifested on the face of the Earth, and knowing little or nothing of her power to utilize, by combination, the different existing elements for purposes of production, has thus been led to judge that the Earth itself, and all the universes of space, are productions, and of the same temporary character.

That there have been oscillations, and apparent upheavals, and apparent depressions of portions of the Earth's surface, as geologists declare, is unquestionable. But that these seismic actions were confined to a mere crust of the Earth, floating on viscosity, or a molten sea of fire, and whole continents raised 2,000 feet in the air to freeze, is exceedingly doubtful. Such foundations and

such results do not seem probable enough to warrant a belief in such methods to produce the glaciers of a globe. It is far more likely that the traces of glacial action found on mountains thousands of feet above the general surface of the continent, were made there during the swaying of the Earth, when the oceans' waters which were temporarily thrown there were frozen over, like the polar seas now, by being turned from the sun. Upon the reversal of the Earth in swaying back, vast quantities of the ice would naturally be left behind by the retiring waters and more or less of glacial action take place. The repeated swayings of the Earth would necessarily produce a succession of glaciers, each one shorter than its predecessor. This action easily explains the problem given by G. Frederick Wright; D. D., in his *Ice Age in North America*, where he says: "From a combination of causes which cannot yet be explained there were periods of rapid advance alternating with periods of retreat, intercalated with long periods of established equilibrium."

Among all the different theories yet announced by investigators regarding the cause of the Glacial period, none have proved convincing or satisfactory to the geologist or astronomer, so that, at last, they have come to the conclusions given by Professor Le Conte and Rev. G. Frederick Wright; the former saying: "The evidence at present, therefore, is overwhelmingly in favor of the *uniqueness* of the Glacial epoch," and the latter says: "The sum of the whole matter, so far as theory is concerned, seems to be that as yet we do not know what was the ultimate cause of the Glacial period."

But for the discovery of the central turning of the Earth, and its resultant swaying motion,—the key to the whole Glacial mystery, the world would have remained in ignorance of that cause until another experiencing of that dread event.

THE GLACIAL EPOCH.

In the foregoing pages reference has frequently been made to a Glacial epoch and Glacial action. If this theory of the Earth's third motion is accepted as true, it is not difficult to account for any Glacial epoch of the Earth, and there have been countless numbers of those epochs, if the third motion is periodical.

By reference to the illustration in the frontispiece it will be seen the Earth is bisected with two Meridians,—a Torrid and a frigid; the former extending from the Sun's center to the Earth, and the latter from the Celestial North through the Earth's center. These two Meridians stand at exact right angles with each other. Each has its own zone, the former one, the latter two, which widen and narrow as the Earth pursues its orbital motion, revolving on its axis. The plane of the Torrid Meridian is flat; the plane of the Frigid Meridian that of a variable elliptical cylinder, of the exact size and shape of the Earth's orbit. It divides the Earth in two unequal parts.

As darkness is the absence of light, so is cold the absence of heat. Whatever sides of the Earth are presented to the deadly influence of the Frigid Meridian are sure to be frozen. Even a living volcano will succumb in time. The heat of the Earth is entirely latent, like that of a block of ice. It is never manifested only when excited to action by extraneous causes. Attrition is one cause, occasionally producing the extreme of a volcano; the impinging of the sun's rays is another, but milder and more

general in results, because more scattered,—if concentered, a live fire is the result. Pressure is still another exciting cause. But there is no more compression about the Earth's center than there is about its circumference, where there is absolutely none beyond that of the air, because the Earth is composed of concentric globular arches, each one self-sustaining, and, running from the center outward, growing proportionately lighter, lifted by centrifugal force, the result of rotation. The thermometrical measure of temperature at different depths of the Earth is mainly that of the superincumbent air under increased pressure. The absorption of the heat by surrounding rocks would have a tendency to lower the record.

There being a total absence of all exciting cause to develop the Earth's latent heat on the line of the Frigid Meridian, all things are frozen there, and the ocean waters become vast mountains and fields of ice. Let any sides of the Earth be turned into that Meridian and the result will be the same. *The Glacial epoch and the Earth's central turning prove each other.* By reference to the illustration it will be seen that wherever the Earth has stopped to reverse its swaying motion, there glaciers have been formed, if water was present. A succession of glaciers is the result, and the extent and number of the Earth's lateral oscillations, during its last period, may be approximately ascertained by noting the different terminal moraines and marginal deposits on the Earth's surface. It is nothing but confirmatory if the different moraines and deposits do not extend to the same parallel of latitude or degree of longitude, because the reversing points of the oscillations would naturally vary in location,—besides, the waters of the overflowing oceans would not reach everywhere at each reversal. During these periods of transition it would be unavoidable that great storms should prevail of wind, and rain, and snow, before which any with which we have acquaintance as now transpiring would sink into insignificance.

The reason why the higher mountain peaks are always cold is because they present but a meager flattened surface for the direct impinging of the sun's rays, resembling in this respect the polar regions, and they stand too high for heat to run from the lower level of the Earth's surface, even at the equator. But if a whole continent were raised, or the whole Earth enlarged to the height of the mountain peaks, the same climatic conditions would result that prevail now. If a quantity of the sun's rays were concentrated on a mountain peak, of any height, intense heat would be the result.

Dead and dying volcanoes give no evidence whatever that the Earth is cooling off. As their activity gradually ceases their heat returns to its original latent condition in the Earth, though a portion of it takes the air route to get there. It is then ready to manifest its presence again upon the recurrence of any adequate exciting cause. These remarks will also apply to the sun. There is a wild seismic action going on incessantly in that vast body, which is doubtless caused by its repeated central turnings through all the ages, and which will be repeated forever in endless periods. Its fires will never become extinguished, for in so vast a body, 1,245,000 times that of the Earth, and its mass 674 times that of all the rest of the solar system; one of its volcanoes would probably equal 50,000 of the largest the Earth has ever had, or is capable of creating.

And yet all of this heat is of no avail on the Frigid Meridian to prevent the forming of glaciers, because the body of the globe is interposed, and shuts off the action of heat along the Torrid Meridian, at the same time exposing itself to the intense action of the former.

MOUNTAIN PERIODS.

If further evidence were needed to prove the Earth's Third Motion it may be found in the existing Mountain chains. A superficial glance, even, at any large-sized school globe will show ranges of mountains in parallel sets running north and south, and other parallel sets running east and west, general directions. All of these parallel sets were created in successive periods of the world from each other, and each chain records a period of the Earth's central turning. The chains extending north and south mark those periods of the Earth when it was turned to its present position; the chains extending east and west mark the periods when the Earth was turned so as to reverse the present position of the poles with the equator. The present Coast Range was probably created at the last central turn,—it being the youngest of all the chains. Nevertheless there may be localities of the Earth where chains of mountains may rise and fall with successive turnings. This idea is probably correct, for were it not, by this time, the Earth would be but a jumbled-up mass of broken mountains, and there are evidences of the foregoing fact now existing on the Pacific coast, but the disappearance of such mountains has been accounted for by the extraordinary theory that they have been jack-planed down by glacier ice!

The $26\frac{1}{2}$ miles lying between contraction one way and expansion the other of the Earth, under the powers of centripetal and centrifugal force, upon its central turning,

seems quite cause enough to account for the existence and disappearance of all mountains on or beneath the surface. *The Mountains and The Third Motion prove each other.*

No internal heat of the Earth had anything to do with the creating of Mountains, but the birth of the Mountains, under the action of the two laws, had everything to do with the heat,—creating or exciting it by attrition. All igneous action has been of a local character,—a result instead of a cause. Of course this action would occasionally reach to great depths in the interior of the Earth, and result in the development of heat of an awfully intense character and on a grand scale, pouring forth, as Le Conte says, vast sheets or rivers of lava from wide fissures, extending for miles, and establishing for a time great volcanoes. But the immense size of the Earth renders all these results petty by comparison. The cooling off of the Earth is but local in its character,—that of a general action is but a fable, and simply a piece of the creation theory.

Erosion does not make mountains,—it does its best to destroy them. It attacks all things alike on the Earth's surface and it would be strange if it did not manufacture now and then a hill, for some parts of the surface of the Earth are easier of erosion than others, and the hardest would naturally be left in prominence.

One fact regarding existing mountains is generally overlooked in treating of the subject, and this is, that there are Mountains of great heights submerged beneath the waters of the oceans. Deep sea soundings have revealed that fact, and there are almost innumerable peaks rising just above the surface, constituting islands of every conceivable size and shape. A thorough investigation would doubtless bring to our knowledge the existence of extensive chains marking the submerged part of the Earth with as much regularity as that unsubmerged. Previous to the last central turning of the Earth it is doubtless true that thousands of these peaks towered aloft in silent grandeur, beheld by the wondering gaze of prehistoric man; and that there were green valleys and level plains between, populated with beasts, and birds, and creeping things. The cattle lowed upon a thousand hills, and the air was filled with the music of feathered songsters. And so shall it be again, upon the next turning, for nature repeats herself, forever and forever.

CONTINENTAL ELEVATIONS.

That continental elevations have had little or no influence on the flora and fauna of the world is proved by the facts in the case. According to Le Conte, who gives the most recent and reliable results, the mean elevations are as follows:

Europe, 984 feet; Asia and Africa, 1,640 feet; America, North and South, 1,083 feet; Australia, 820 feet. The mean height of all land is given as about 1,378 feet.

If prevailing theories as to the cause of the Glacial period are correct, viz, the uplifting of continents, then Asia and Africa ought now to be much colder than Europe; and North and South America, in a large majority of its parts, much colder than Australia; and really the lands of the north and south poles ought to be more torrid in their climates than any of the rest of them, for in these theories the influence of the sun has been left out of the account. But the facts are, that the very reverse of all this is the truth, and that the sun's influence has everything to do with the climates of the globe. If the sun's influence were entirely withdrawn, the Frigid Meridian would have the Earth in its icy grasp, and it would be frozen solid, and every living entity perish, for cold is—death, as heat is—life.

Too great a refinement of science is sometimes as dangerous to truth as too little of it,—its sharp edge sometimes whittles away the entire stick, and, after all is gone, still keeps up the motion and whittles on nothing.

The more direct the rays of the sun the warmer the climate; and the more oblique the rays of the sun the colder the climate, for the Earth's heat is entirely latent: until excited to action by an adequate cause. There is no general active heat in the sun itself. Even its rays are cold. They strike the Earth like so many hammers, exciting the latent heat of the Earth. In entering a greenhouse their impact on the glass, in passing through it, renders the glass hot, by exciting its latent heat, and when those rays, still cold, strike the inside ground and plants their latent heat is developed, and their caloric, set free, warms the inside air.

No raising of continents is going to freeze them, without a thin crust is set up edgewise, and no lowering of them is going to heat them, without they are put down in a hole, and no air was ever rendered, by miraculous or other means, hot enough to make a torrid climate on the frigid meridian. A *reversing*, and not an elevation, of continents, will alone change their climatic conditions.

POPULATION.

But for the destructive power of the Earth's Third Motion, it would, ages upon ages ago, have been over-populated. Darwin says that "there is no exception to the rule that every organic being naturally increases at so high a rate that, if not destroyed, the Earth would soon be covered by the progeny of a single pair. Even slow breeding man has doubled in twenty-five years, and at this rate in less than a thousand years there would literally not be standing room for his progeny." And Mr. Edward Clodd, in his Story of Creation, further says that "if all the offspring of the elephant, the slowest breeder known, survived, there would be in 750 years nearly 19,000,000 elephants alive, descended from the first pair. If the eight or nine million eggs which the roe of a cod is said to contain developed into adult cod-fishes, the sea would quickly become a solid mass of them. So prolific is its progeny after progeny, that the common house-fly is computed to produce 21,000,000 in a season; while so enormous is the laying power of the aphid, or plant-louse, that the tenth brood of one parent, without adding the products of all the generations which precede the tenth, would contain more ponderable matter than all the population of China, estimating this at 500,000,000!

"It is the same with plants. If an annual plant produced only two seeds yearly, and all the seedlings survived and reproduced in like number, 1,000,000 plants would be produced in twenty years from the single ancestor. Should the increase be at the rate of fifty seeds yearly, the result, if unchecked, would be to cover the whole globe in nine years, leaving no room for other plants. The lower organisms multiply with astonishing

“rapidity, some minute fungi increasing a billion fold in a few hours, while the protococcus or red snow, multiplies so fast as to tinge many acres of snow with the crimson in a night.”

The theory commonly advanced to account for the present paucity of numbers of animate and inanimate life is that “More organisms are born than survive,” which fact is true enough, but is wholly inadequate to account for the situation, for the Earth is doubtless as old as Eternity. Scientific men would long ago have entertained this latter opinion, could they have harmonized that fact with the existing phenomena of the globe. And even now they are at their wits’ ends to know what is to become of the population of the Earth, so rapidly is it increasing. They even wink at the prospect of approaching bloody wars as justifiable means in thinning out the human population, little understanding that there is coming a time when the Earth will need all of its population. As stated first above, but for the central turning of the Earth it would have been over-populated ages upon ages ago, and man would have been obliged to resort to a destruction of all human rights to maintain an existence. *The paucity of population and the Third Motion prove each other.* Countless millions of times has the bulk of the Earth’s population been swept out of physical existence by its central turning, and that periodical action will continue forever. In view of this awful destiny, it is better for man, the child of nature, to refrain from wars and the consequent murdering and physical annihilation of each other, and to “multiply and replenish the earth.”

To place the two theories in juxtaposition, one is a created young Earth, to account for the present paucity of population, with a growing fear that in the comparatively near future the Earth will be unable to sustain the natural inevitable increase; and the other is an eternal existing Earth, the third motion of which always has limited and always will limit its population of all kinds, and the absolute knowledge of what is to come, putting to an end all anxieties, saving that concerning the exact time of the event. These two theories apply to all the endless Universes that pervade the boundless immensity of shoreless space.

PHYSICAL DISTURBANCES AND CONSEQUENCES.

As is well known, the present form of the Earth is not that of a perfect sphere. Its largest equatorial diameter exceeds the polar by about $26\frac{1}{2}$ miles. This is caused by centrifugal force acting on the revolving globe, distending its middle and contracting its polar sides. Upon a reversal of the poles and equator the Earth will reverse its form also. The present polar diameter will be extended and its equatorial diameter contracted, until the $26\frac{1}{2}$ miles difference is again established as at present existing. Barring the action of the oceans' waters, this change alone will cause, at the time, a terrible breaking up and commotion of the globe, revolving at the rate of more than 1,000 miles per hour. Its component rocks will be torn and crushed and ground, while whole continents will be disrupted, upheaved, and sunk in the depths of the seas. Vast chains of towering mountains will be thrown up with lofty peaks destined to stand for another lapse of ages. Mighty volcanoes will be forced into existence again in strange parts of the Earth, caused by the grinding together of interior rocks. The vast fields and mountains of polar ice will be melted under the torrid heat of a tropical sun, and other vast fields of ice created at the new poles to remain for a period of ages, and other immense fields of ice created and destroyed, and re-created and as often destroyed, repeatedly, during the temporary swaying of the Earth.

All of the foregoing will not be done in a day or year,

but there will be a tremendous period of time before the Earth shall become settled to its normal position and motion, and even then for long ages it will continue to manifest signs, through seismic action, of the great change through which it has passed,—signs the counterpart of those experienced to-day. For it must be borne in mind that when the Earth changes its position it also changes its motion to a direction ultimately at right angles with its previous motion. At first the motion may be described as spiral or twisting, and it is possible that as the Earth sways far around it is brought gradually, first, to a dead standstill in its axial rotation, and second, to a temporary reversal of its motion, if the power of axial momentum does not outlast the central oscillation. While this action may be a prolific cause of local disturbances, and result in the formation of vast glaciers, it is probably in no wise disturbed in its orbital motion, certainly not to any fatal extent. The Power which handles this vast globe does it more easily than a school-boy does his ball at play, and the globe itself is more solid than one made by man of solid glass, if the theory of the Astronomers in this respect is correct.

In the foregoing I have only mentioned those physical disturbances which are known to be inevitable upon the central turning of the Earth. There is another consequence which I believe will result from said turning. From the mists overhanging the wild rush of the world's contending oceans,—mixed with the impalpable motes arising from the attrition of the crushing, grinding rocks of the unsubmerged part of the Earth, I believe there will be thrown out, by centrifugal force, vast vapory rings which will encircle the revolving globe. In turning, the magnetic currents will of course cross their previous direction at right angles, thus partially demagnetizing the Earth and permitting centrifugal force to overpower, to a limited degree, the Earth's magnetic attraction. This new condition will gradually yield, however, as the Earth becomes more thoroughly magnetized in its new

condition, until, at last, it will overbalance the centrifugal force and recall, by its superior power of attraction, the surrounding rings. I believe the planet Saturn to be a living illustration of this theory, but it being much further from the sun than the Earth is, it is necessarily slower of recovery.

But there is a further consequence to be considered in this connection, and one which will account for the existence of the "wanderers" of space.

Should centrifugal force, aided by the near proximity of a neighboring planet, succeed in detaching an outlying portion of one of the rings aforesaid, a new comet would be the result, which would go off in an orbit of its own, only to return again at long intervals revisiting the scene of its birthplace. The comet of 1861 was doubtless thrown off from the Earth at its last central turn. It returned in that year to pay a visit to its mother.

The asteroids, aerolites, meteors and other like bodies are also a result of the same cause, mere debris thrown off from central turning planets,—but remaining within the attractive influences of this solar system.

Just when the Earth experienced its last central turning, and at what future time the next may be expected may be approximated with a certain degree of accuracy by a series of observations at the 284th degree of longitude east from Greenwich, near Quito, Ecuador, South America. In my opinion the equator will become fully rounded out to a perfect circle before another central turning. I think that the constant effort which the Earth is making to accomplish the foregoing result is the main cause of the incessant seismic action going on, and that it will be found upon proper investigation that the equator is rising at the point indicated. The rate of its rising ascertained, the information sought may be given by simple calculations. It can at least be approximately ascertained what time has elapsed since the Earth's last central turn. It is now about twenty-four twenty-fifths of the time, judging by the Earth's equatorial measurement.

SUMMARY OF PROOF.

1st. The present equator is flattened on the two opposite sides located at 104° and at 284° east from Greenwich, respectively.

2d. The flora and fauna of an ultra-tropical climate surrounds the Earth, wherever there is land, regardless of present climatic conditions, at a distance midway between the aforesaid flattened sides.

3d. Traces of vast glacial action in regions remote from the present poles and now under the rays of a temperate and torrid sun.

4th. Transfer of the oceans away from their former water-lines.

5th. Seismic action, under centrifugal force, of the Earth in its endeavor to round out the present equator to a perfect circle.

6th. Existence of living and extinct volcanos, caused by great heat-creating attrition.

7th. Existence of vast chains of mountains which have been crowded out of the Earth as it changed form.

8th. The presence of immense masses of the cast-off debris of the planets in the solar system, of all sizes and shapes, from the meteor to the asteroid, and the occasional return of some of it under the Earth's attraction.

9th. The closing of the orbits of various comets within the influence of this solar system, showing that those comets originated here, and are of like substance of the rings of the planet Saturn, and which rings are unnatural for permanent existence, if the testimony of the rest of our planets is credited.

10th. Paucity of population, caused by the bulk perishing at each central turning of the Earth.

APPENDIX.

I reprint herewith certain extracts, which I have cut at random from the newspapers of the day, which are of interest as evidence confirming statements herein before made concerning buried cities, prehistoric man, nonexisting nationalities, existing glaciers, and the south pole. New discoveries are fast being made which are eclipsing those recorded in educational works, and which tend to confirm the theory of the Third Motion. Time will doubtless make all clear.

THE FLOOD.

The following is the bible account of the flood after the eliminating of all extraneous matter, viz :

Noah was six hundred years old when the flood of waters was upon the earth.

In the six hundredth year of Noah's life, in the second month, the seventeenth day of the month, the same day were all the fountains of the great deep broken up, and the windows of heaven were opened.

And the rain was upon the earth forty days and forty nights.

And the waters prevailed exceedingly upon the earth; and all the high hills that were under the whole heaven were covered.

Fifteen cubits upward did the waters prevail; and the mountains were covered.

And the waters prevailed upon the earth a hundred and fifty days.

And God made a wind to pass over the earth and the waters assuaged.

The fountains also of the deep and the windows of heaven were stopped, and the rain from heaven was restrained.

And the waters returned from off the earth continually; and after the end of the one hundred and fifty days the waters were abated.

And the waters decreased continually until the tenth month; in the tenth month, on the first day of the month, were the tops of the mountains seen.

And it came to pass in the six hundredth and first year, in the first month, on the first day of the month, the waters were dried up from off the earth.

And in the second month, on the seven and twentieth day of the month, was the earth dried.—*Extracted from Genesis, chapters 7 and 8.*

The foregoing is probably the oldest historical record in existence of the physical disturbances caused by the most recent of the Earth's central revolutions, or third motions, and being such, is among the invaluable evidences which stand as proof of the new theory, for there is no effect without an adequate cause.

Concerning the record itself, it may be that of an awful legend, descending from generation to generation, through the dark unlettered ages of man's prehistoric existence, from the time of its occurrence until caught up by the pen of the historian, and it may be otherwise—the world is judge.—*Marshal Wheeler, in The Oregon State Journal.*

ERRORS OF GEOLOGY AND ASTRONOMY.

The grand error of all investigators in treating of the Earth, the solar system and the universe of space, has been in assuming that they were all *created* existences. Utterly unable to find a foothold on absolute nothingness to commence the creation of the Universe, they have been driven, by early erroneous influences, to take their stand upon the infinitesimally minute platform of the Atom, thereby assuming that it is an eternal existence, in flat contradiction of the assertion that "the earth was without

form and void." for nothing can exist without form, and form destroys void.

With the Atom in hand they have proceeded through the most evanescent, imperceptible next-to-nothings, through a something-to-be, and non-existing what-nots, wasting untold countless billions of ages, to produce the Atom. Proceeding thus, step by step, to create the Universe, they draw out the long process until Eternity itself grows gray, and lapses into the imbecility of second childhood.

Through all the ages of man's investigations, the heavens have been raked over and ransacked in the vain desire of finding some adolescent youth in process of formation, or some old world going to destruction, to confirm their theory of creation. But the nebulas all became resolved into stars, the comets remain *in statu quo*, if they don't lose their tails in contact with some planet or moon, and an occasional astral body retires out of the instrumental sight, behind some of the multitudinous opaque planets revolving around the astral suns, and all goes serenely until that bright particular star looms up again, to the investigator's confusion.

Having thus created the absolutely countless universes, which are as numberless as space is boundless, they find themselves with an earth on hand, supplanting the original Atom, and the next thing to do is to create life on its surface. Where that life comes from, or how it gets here, the scientist is at last frank enough not to guess,—he only asserts that it had a beginning here. He is led to this conclusion because he can find no trace of it beyond a certain period back among the ages and their representative rocks of ozoics and arys. But in the creation of animate and inanimate existences he has one grand advantage to begin with; he has Matter! After bringing to his aid Power and its resultants, Force and Energy, in some inscrutable way he makes a mixture of these so-called ele-

ments, and the result is an Oldhamia!—a seaweed! Another little mixture, with a little change of method, and lo! a Strophomena!—a lampshell is produced! But during these processes more countless ages upon ages have trooped away into the eternal realm of the everlasting past, and he has but just begun his creation of life-forms upon the Earth. But with the Oldhamia and Strophomena, in place of the Atom in hand, he proceeds, by the help of another series of interminable ages, to run the whole gamut of Darwinian evolution, until, at last, he has evolved “the survival of the fittest”—an oak tree and a tailless Man! By this time Eternity must be dead, and buried in the everlasting cemetery of the gods. And these are the teachings of modern science! From those of the ancient variety, heaven defend us all!

Some theorists, bolder than the rest, drawing a little nearer to reason and proportionately farther from revelation, start the creation of the worlds from an eternally existing amorphous mass of cloud-like vapory matter, which had floated forever through the regions of boundless space. By degrees an eternal law takes hold of the endless mass and commences rolling up white hot balls—to cool off! What this eternal creative law had been busy about, previous to starting in on this work, is not even suggested. This theory, like the other, is but an exhibition of the lamentable weakness of the finite in dealing with the infinite.

This whole theory of a creation, so far as the worlds of space are concerned, is one stupendous error; and so far as the entities of the earth are concerned, a huge mistake.

The universes are the expression of Eternal Permanence. Without them there is no material evidence of an intelligent, harmonious Eternal Principle.

There never was a first world nor a first universe. The universes were never created; they have always existed. Reason proves this from the following facts, viz: Space is

boundless; the universes pervade all space; they are therefore countless—no beginning nor end to their numbers; therefore impossible of creation, and therefore eternal existences.

The universes are all subject to the laws of eternal motion devoid of all friction, which proves that they are pervaded by the principle of eternal life, and are therefore alive,—not dead.

They cannot gain anything from the emptiness of space, and they cannot lose anything. The debris thrown off at any one time, by the component individuals of a system, is forever retained within the influence of that system, and at another time regained. This is under the action of rhythmical and of regular law.

All animate and inanimate life upon the Earth is but the expression of her sustaining power forever. It is an eternal quality.

There never was a first man; he never was created; he has always existed, and will always exist. As an individual his existence is rhythmical; as a whole his existence is eternal.

Evolution is a mistake, if taken in the ascending, scale; if in the reverse, it is a partial truth. If misfortune environs man for ages, causing disuse of mental and physical belongings, he will degenerate towards the monkey; but the monkey can never progress towards the man under any circumstances.

That which is true of man is also true of all living entities sustained and nourished by the Earth.

There is a prime family of beasts, birds and fishes of eternal existence. Secondaries are but the melancholy representatives of long disuse. The bird that never uses its wings will lose them—the extinct auc is an instance; but the prime auc—the wild goose—still lives in perfection. There is a tribe of Indians on Puget Sound, who, for many succeeding generations, have sat in canoes and

fished so steadily that they have now almost entirely lost the use of their dwindled-up legs. Their brains are degenerating towards the monkey.

If evolution ever produced man, the same process would still be going on, for nature's laws are imperishable, and there would be no necessity in nature for changing the process. Man has never witnessed that evolution. The growth of a seed is not evolution; it is the slender but potent thread connecting the rhythm of eternal existence.

The theory of evolution is but that of a slow process of creation, beginning with the Atom away back before the alleged creation of the first world of unnumbered throngs of the universes pervading eternal space, which creation has been shown to be absolutely improbable.

The universes themselves give no evidence of ever having been other than what they are now. That those vast bodies occasionally throw off nebulous masses is more than probable. But sooner or later those masses are recalled. They never originate a new world, nor get out of reach of the home influence. Such masses are invariably thrown off upon the central turning of some planet or sun. From eternity that action has been going on, and it will continue forever.

Let us accept the existences of eternity as we find them, and not endeavor to rob the Eternal of the infinite glory which blazes forever in that fathomless profound which has neither beginning nor ending.—*Marshal Wheeler, in The Oregon State Journal.*

A BURIED CITY DISCOVERED.

RUINS OF A FORGOTTEN RACE FOUND IN HONDURAS.

The "buried city" referred to in the following account, was doubtless built millions of years ago, when the Earth occupied its *present* position. Subsequent to its building the Earth turned upon its center and the city was thrown into the frigid zone of the South American pole and buried

in ice. A repetition of the Earth's central turning has thrown the city again into the torrid zone and exposed it to view.

The Los Angeles *Times* of July 8, 1889, published the following special dispatch from Tegucigalpa, Honduras, from A. J. Miller. He said:

It was not until now that I was at liberty to inform you that I had made a discovery of a buried city hitherto unknown to the civilized world, it being necessary to take precautions against others robbing me of the fruits of the find. The discovery was made during our sojourn at Olancho, about a month since, and I have just obtained from the Honduras government the exclusive right of excavation. The ruins are located in the new department of Mosquito, about 150 miles from the mouth of the Patko river, and ten miles from the mouth of the Guampoo, one of its main tributaries. They are approached only by river, no path or trail passing within three leagues.

The Indians of this region are the Poyas, and none of their traditions point to the existence of such ruins, so that they antedate their oldest civilization. The ruins are partly buried by the debris of ages, and covered by an immense forest. They are perhaps two miles square, and the greater portion is in an excellent state of preservation. Our casual inspection developed not only evidences of a former city partly surrounded by a wall, but an immense workshop where ancient Indian sculptors manufactured. Many beautiful designs were observed. White granite entered largely into all the implements and utensils found, and this presents a curious study, as no stone of this class is found anywhere in this immediate section of Honduras.

Among the relics, in good preservation, were found immense tablets of stone weighing 800 pounds, granite bowls on three legs weighing forty pounds, fortillas, blocks of various sizes weighing 25 to 600 pounds; urns and vases, chased in curious hieroglyphics, are ornamented with the heads of snakes, turtles, tigers or rude human forms. The carving and general ornaments were similar in some respects to those found about Capan and Quiergua. They are undoubtedly very ancient.

TIME--ETERNITY.

Time is a purely human invention, and is measured primarily by the motions of the Earth,—one revolution on its own axis, from west to east, is called a day, and one revolution in its orbit, around the sun, is called a year. In due course of events there will be another measurement known as *periodical time*, consisting of an aggregation of years, expressing the lapse between the Earth's central turnings.

The foregoing are all local motions. The general motion of the whole solar system, toward the constellation of Hercules, may sometimes become known as *system time*. Its orbit will have to first be determined by those sublime investigators,—the Astronomers, than whom no more conscientiously faithful men ever lived.

Time is divisional measurement in eternity. The error which mankind has made was in assuming that the realities of eternity would never be experienced until man had passed the bourne of physical existence, and become a spirit. The fact is, that he is now living in, and is one of the component things of, eternity. He is surrounded on every side with its existences; if his eyes are turned to the earth he sees one, and every living thing on the earth discloses the same, and the apparently dead tell the same tale. And when his glance is cast upward in the dark, cool hours of the cloudless night, he beholds in the infinite universes of space the entities of eternal existence, hoary with the lapse of unnumberable ages, and yet shining with an effulgence of youth forever unquenchable.

There is no past, or future; all is one eternal present, and this is the God-like birthright of every human being, and the grandeur of this eternal life outreaches all finite conception.

CHILDREN OF THE SUN.

RECENT DISCOVERIES IN THE LAND OF THE INCAS—A NATION EDUCATED IN THE ARTS AND SCIENCES.

The following, published in the *Oregonian* July 21st, 1889, is a brief history of a nationality which was broken up and frozen out of their country at the time of the burial in ice of the foregoing described city. The account is of invaluable archæological interest in this connection. The nation appears to have occupied too great an extent of territory to be entirely wiped out of existence:

“It was for the purpose of learning the history of the Inca empire, which has never yet been published in the English language, that I spent some years among the ruins; and to complete my work it is necessary that I should again make a visit to the land of the Incas. But one translation has been made of LaVega’s work and that is very unsatisfactory and inaccurate: a great deal of history is given, but the work is full of gross exaggerations. My work is partially completed and I am able to give some facts about the wonderful Incas which have never before been placed before the public.

The extent of the Inca empire was from 4 degrees north latitude to 34 degrees south latitude, about 3,000 miles in length, and some 700 miles in width, on an average, or nearly as large as the United States. It was founded in the year 600, A. D., by Manco Capac and his sister wife, Mama Oello. There is a tradition that they were sent by the Sun to civilize the Indians of the Andes, who had become warlike and cannibalistic in their customs and habits. *Seemingly prior to this period a vast empire had spread over the table lands of Bolivia and Peru, the ruins of which are seen on all sides to-day, consisting of cut stone, copper impressions of hinges, carvings, temples, etc., which all antedate the Inca empire. Even the Indians prior to the Inca period claim that these ruins belonged to an extinct but wholly civilized race of people, probably analogous to the times of the Mound Builders of North America.* The most prominent center of these is Tiahuanco. At the time of the conquest by the Incas, the great Indian centers of the Andes were at Pachamanac, thirty miles south of Lima, at Old Huanaco, which is in the heart of the Andes in the center of Peru,

and at Quito, in Ecuador. *In these places to-day are to be seen the ruins of the old temples of the Indians and by the side of them the newer temples erected by the Incas.*

The tradition is that Capac was sent by the Sun and placed on the islands of Lake Titacaca, and these islands are held sacred to-day by the Incas. These people were ordered to take a golden wedge, which was given them, and carry it northward until it should leave their hands and disappear in the ground. At this place they were to erect a city, which should be their capital, and should commence their mission of civilizing the Indians, teaching them the science of agriculture, the art of manufacturing cloth and necessary articles for their domestic comfort. The city was built. They termed it Cuzco, and the ruins of it exist to-day in upper Peru. They called the country Tiahuantin Suyo, which means "the whole of the world." Prescott has always termed it the Inca empire, and that is what it has always been known by. I prefer the original name, and call them Suyos for short.

Now as to the government of the Incas. The word Inca means royalty, merely. It was ruled over by a king, one of the Incas, who was the oldest son, and who was father of the whole country. Therefore it could be called a patriarchal government, as well as a dynasty. The king prescribed just laws for the people, governing even their most minute domestic duties, prescribing their food sufficient for each meal. The land belonged to the reigning Inca, and each person was allotted so much to work each year, the products of which did not belong to the laborer, but to the king. These products were placed in large store-houses in different parts of their kingdom, where at certain intervals each family was allotted its share for the ensuing year or period. The artisans deposited their manufactured products in like manner, and they were allotted in the same way.

In their judicial department, while the king was a supreme court in himself, yet the country was ruled over by courts—one inferior, one supreme in each department. Below these were courts similar to our justices' courts, where cases were tried by arbitration and punishment meted out according to the decision of the official, or of the judges. The greatest punishment—the one that seemed to predominate among these people—was the striking of the criminal upon the upper part of the back, between the shoulders, with a stone, which sometimes produced death.

Their laws were classified as follows :

1. Municipal laws, treating of the revenues of the different departments.

2. Agrarian laws, treating of the division of the land among the different departments and the people.

3. The public law, specifying the prominent divisions of public work which benefitted the people in common. Under this law they had a superintendent of highways, a superintendent of bridges and a superintendent of aqueducts.

4. A law that stated the arrangement of the time of labor which belonged to the different provinces, towns and individuals.

5. Brotherhood laws, providing for mutual assistance in the cultivation of the earth and construction of buildings.

6. Laws of economy. These dealt with the ordinary personal expenses and prescribed the quantity of food and clothing to be used by each individual. These laws also ordered that two or three times a month the people of each neighboring town should dine together in the presence of official governors, that they should join in military and popular amusements at the time with a joyful mind, to root out all feuds and passions and give peace entire reign.

7. Laws in favor of the sick or maimed. These laws ordered the deaf, the dumb, the blind, the crippled, the deformed, and all the infirm to be supported from the public funds; also that these unfortunates should be assembled two or three times a month to feasts and public dinners, where there should be general rejoicing, for the time forgetting in part their miserable condition.

8. The law of hospitality, which prescribed means of supporting travelers or strangers in different parts of the empire at the expense of the public.

9. Household laws, regulating the work of the individuals, prescribing even for the child 5 years of age an occupation proportionate to his strength and physical ability. This law, however, was often changed if it was noticed that a child had talents in another direction. Under the same laws it was ordained that inhabitants should eat and make merry with open doors, so that the minister of justice might have liberty to visit them. There were officials called superintendents of the pueblas, who visited very frequently the temples, the public buildings and the private buildings, watching the order, neatness and well

doing of the people, punishing the unclean and lazy with blows upon the arms and feet, and praising in public those specially clean and neat.

The criminal code consisted of thirty-seven sections, the laws being very severe, but just. Among the penalties for crime were:

Rebellion against the king, extermination.

Blasphemy, death.

Highway robbery, torture and then death.

Abortion, death for principal and accomplice.

Disobedient sons to be punished in public by their fathers.

Insolence to the authorities, imprisonment.

Attempt to escape by criminals, imprisonment.

Any woman committing adultery was put to death.

Robbing from a son of an Inca, death, but robbing from a person not an Inca was not punished.

Officers who allowed a prisoner to escape had the same punishment inflicted on them that the prisoner was sentenced to suffer.

Breaking the law in any way was regarded as an insult to their gods as well as to their king.

Their military department was very large and efficient. While it was very weak at first, yet it developed into one of the largest and most determined ever known. Like most other nations, they pushed their conquests into the most remote regions. Their motto was always "Peace and good will to men," yet woe betide the nation that refused the Inca yoke. In order to have a well-regulated army the law claimed every man as a soldier, and he was trained in the arduous tactics of the empire two or three times a month. The army was noted for its sobriety, civility, subordination and the tranquility with which members met death at the post of duty. But while so much military duty was exacted of all men, their trades never suffered for want of attention except in one long continued strife, for a rotary system was adopted allowing a soldier to return to his home once in three months to attend to his domestic duties and work at his trade, the leaves of absence being regulated by the severity of the war being waged. The commander-in-chief was the reigning Inca; immediately beneath him was the general, who had his lieutenants, and the rest were divided in the following order: Every 5,000 men were under a major-captain and his lieutenant; the half of this number was placed under

a captain and his lieutenants. These divisions were further divided into battalions, regiments and companies, with their respective commanders. Each division had its ensign bearer, its trumpeter and drummer. The men were armed with wooden and copper swords, the copper being tempered, by some process now unknown, until it was as hard and as fine as our common steel, war clubs of copper, lances with copper heads, stone and copper axes, slings, and, in rare instances, bows and arrows. The movements of the armies were regulated by drums and trumpets.

All the Incas were trained in the most Spartan-like manner for the field of battle, each one being in the army from the time he was 16 years old until he had arrived at the age of 70. When he had completed his military education at the capital an army was called together and he was placed at its head to gain his first victory or suffer his first defeat. If victorious he was at once accounted a great warrior, but if defeated the people placed little confidence in him. It did not take long to collect an army, as the Incas had four great roads leading out from their capital, over which the king's orders were despatched with great rapidity, sometimes over 150 miles a day being covered by the couriers. These roads were paved with flagstones, and were from twelve to fifty feet in width. The road from Cuzco to Quito was the most remarkable ever constructed. It was channeled from the crests of mountainous passes, cut through solid rocks, ravines and precipices, with solid masonry and sometimes suspension bridges, maguey and osier woods. This road was about 1,500 miles in length. The other long road led to the south, then west of the capital to the ocean, and from thence north along the west to Quito, over the now arid sand hills and deserts. Nearly the whole length of this road was protected by a high wall in places; gardens lined the side of the road, whose luscious perfume refreshed the weary soldier or messenger as he hastened along to do the king's bidding. Along these grand highways, about a league apart, were placed small post houses which sheltered the messenger who was to travel to the next post as quick as he could, and so on, until the message had reached its destination. In the same manner delicious fruits, flesh, fish, etc., were placed at the king's disposal, which came from the remotest parts of the kingdom. Also at intervals were large granaries and store-houses, filled

with food and clothing for the soldiers, so that they should not suffer with the change of temperature or elevation in their journeyings.

When they waged war they were as saving of their enemies' lives and property as of their own; not that they might be reserved for sacrifices, as with the Aztecs of Mexico, but for the purpose of civilizing them. "We must spare our enemies," said an Inca prince to his soldiers, "or it will be our loss, since they and all their property will soon be ours." As the war proceeded they held armistices for the purpose of negotiating for peace, and when the war was over, as soon as their late foes acknowledged obedience to the Incas, the conquerors did everything in their power to reconcile them to the Inca customs. The chief was taken, with his children, to Cuzco, where the young sons were educated by the wise men in the Inca university, and the conquered chief was recognized as governor of the territory newly acquired by the conquest. But should the new governor remain rebellious, he was removed from his office and he and his people were scattered over the empire. The Incas conquered in order to reclaim and civilize, as they had been ordered by their sun god, and as soon as the conquered adapted themselves to the Inca rule they were left in their territory, where the Incas erected temples to the sun, and founded schools in which were taught the universal language of the empire, rudimentary arithmetic and military tactics. Then they sent one of their statisticians to take the statistics of the newly acquired province and teach the people the arts of agriculture and manufacture. By this mild treatment the spirit of royalty entered into the bosom of the savage, and he became as peaceful as though he had always been in the Inca household. In this manner they enlarged their kingdom until it reached its vast proportion as given above, and contained a population, according to the chronicles, of between 20,000,000 and 30,000,000 people.

When their population became thus dense, their plains and valleys being occupied, and the desert land being irrigated by a wonderful system of aqueducts, they commenced terracing the mountains, so that the sides could be used for cultivation, and to-day these terraces stand as monuments that compare favorably with, if they do not surpass in grandeur, the great work of the Egyptians. The traveler of to-day, as he nears the foothills or passes, or enters the mountains, notices sustaining walls for terrace

farms which covered all of the Andes of Peru in the first and partially in the second ranges, from the snow line down to the plain. Some of these farms are used to-day, but the majority of them have been suffered to fall into disuse.

One other department of industry was known to this nation which was not known to any other people of the western hemisphere, and that was the science of navigation. They navigated not only their rivers, but the coast from Quito to Iquiqui. Their ships they termed "balsas," and they had sometimes one and sometimes two sails, and were seen by Pizarro and his companions when they first discovered Peru.

A word as to the industries of this remarkable people. In their agriculture they had a grand system of irrigation by which they redeemed a great portion of the desert plain of the coast. They terraced the mountains and fertilized the plains, using for this purpose guano, which they obtained from the neighboring islands. Their products were the potato, coco, from which comes the cocaine of to-day, and which they always used as a food stuff, chewing it; maize, and on the coast plains they raised cotton and wool. Their system of agriculture was greatly advanced in regard to the propagation of plants, rotating of crops, and systematic laying out of lands."

MUIR THE EXPLORER.

AN INTERESTING TALK ABOUT THE WONDERS OF ALASKA —THE HOME OF THE ELEPHANT.

The evidence, afforded by the following narrative of Professor Muir, is conclusive that the present north pole was once directly upon the equator and under the heat of the torrid zone. The following dispatch from San Francisco appeared in the *Oregonian* July 7, 1889:

John Muir, of this State, is recognized as a scientist all over this coast. He has a personal acquaintance in Portland and elsewhere in the Northwest, where he has stopped en route to Alaska.

Muir says that he has by no means yet completed his explorations in Alaska, and that in regard to certain elephant remains there, the bridging of Behring Sea and other matters, he hopes soon to add information that will

be of great value to science. Although the bridging of Behring Straits has been widely ridiculed, Muir is inclined to think that such a feat will one day be accomplished.

He says: "Senator Stanford's girdle of steel around the earth via Behring Sea is a perfectly feasible scheme. Behring Straits can be bridged. It is only sixty miles across at the narrowest place, and there are three islands strung along in it. This would divide the bridge up into four divisions. But, besides this, the water is very shallow. In many places it is not over twenty feet deep. I undertake to say that if a man was strong enough to take one of our California redwood trees in his hands he could put it down anywhere over the 600 miles of Behring Sea and yet have 100 feet of it left above the water. This shows how easy it would be to bridge the straits. The only trouble would be from floating icebergs, but that could be easily overcome by constructing swinging bridges, like they have across the river at Chicago. In this way the straits could be kept clear all the time, and trains of cars could run right along.

"There are so many strange things in Alaska," added the discoverer of the Muir glacier. "that have not yet come to the knowledge of the public, that one who has seen them hesitates where to begin. *Elephant remains are found all over the great valley of the Yukon. As a matter of fact, they are found everywhere throughout the great western slope of Alaska.* Dana and Sir Charles Lyle startled the world by announcing that hairy frozen elephants were found wedged among the Siberian icebergs, but scarcely anybody knows that throughout Alaska are the remains of countless thousands of mastodons. You can dig them out and find them on the surface anywhere. I saw hundreds of them, possibly, on my last trip, and I am now anxiously trying to get up there to complete my investigations. *So thick are the elephant remains that the native Indians on finding them, buried partially in the ground, decided they were some kind of great mole that burrows in the soil.* This is the story given me. I collected a lot of remains. *The collecting of elephant tusks every summer, is a regular business in Siberia, just over Behring Sea. We have just as many of them on the Alaska side as they ever had in Siberia. Ages ago great herds of elephants roamed over these shores. Perhaps they existed down to a comparatively recent date, too, for the hairy bodies and well-preserved bones were evidences of that.*"

Portlanders will remember the lecture delivered in that city about six years ago, in which Professor Muir gave quite a vivid description of the Muir and other glaciers, but, so far as known to your correspondent, his own version of how he found the one that bears his name has never before been published.

He says: "It was in 1873 that I first went up there. In my course along the Alaskan coast I followed the chart of old General Vancouver, the British explorer, who, ninety-three years ago, turned his prows into those unknown seas. I found his chart singularly correct. Every little bay and inlet was correctly marked. There are thousands of islands up there, too, and I was constantly surprised to see how accurate he had all of them down. Finally, when I got away up in the vicinity of Cross Sound, I met an Indian who told me that from that on I would have to take my own wood. I was astonished at this, for everywhere for hundreds of miles on our route we had seen nothing but the densest kinds of forests. Well, I told him all right, to go ahead and cut some wood, and he and a lot more did so, and put it on board. We then went ahead, and pretty soon we struck the entrance to what seemed a great bay. I looked at Vancouver's chart, and couldn't find it marked there. There was no mention of it anywhere. The shores all about, as far as I could see, were bare. The whole country was denuded. Some half-petrified stumps and pieces of stone could be seen, and that was all. We steamed up the bay for forty miles, and there found the great glacier which now bears my name."

A PREHISTORIC MYSTERY.

A PETRIFIED BOY FOUND FIVE HUNDRED FEET BELOW THE SURFACE.

The following account, and the four succeeding ones, are chiefly valuable as proofs that the race of man antedates, by millions of years, any history we have of his former existence. The following is a dispatch to the San Francisco *Examiner* from Denver, Colorado, dated August 11, 1889:

A remarkable story reached here to-day from Aspen, Colorado, regarding an unexpected find in one of the principal mines of Aspen Mountain. Late last Thursday

night the night shift in the Minnie mine. Mr. Donnelly, C. W. Mackey, Charles E. Taylor and C. W. Gilfillan, put in two thirty-inch holes in the breast of the 500-foot level of the mine and fired them just before leaving for the surface. On returning to the mine they found that the two blasts had broken into a cavern, the extent and dimensions of which they proceeded to explore. Going in a few feet they discovered that the walls were covered with crystalized lime and lead, which glittered like a cloth of diamonds in the flickering candle light. Here and there little stalactites hung from the canopied ceiling, and the lime formation resembled lace and frieze work of wondrous beauty. Going further in they found that the cave had a descent of about twenty degrees, down which they groped their way. The walls would be quite narrow in places, then widen out as much as twenty feet, forming rooms and chambers grand beyond description.

They had entered about 200 feet when they found on the dusty floor of the cavern a frog, which at first looked to be alive, but upon picking it up Mr. Donnelly found it to be dead, but in a splendid state of preservation.

A little further on a stone ax was picked up. Upon close examination it was found to be flint, and the eye was filled with dirt and dust, which was easily removed. How it got there was a mystery that not only puzzled them, but as all men who work underground are more or less superstitious, they were not a little scared. Going a little farther, they came to a steep declivity of about 45 degrees, down which they slid until they reached at the bottom a pool of clear, sparkling water about eighteen inches deep. They crossed the pool, and had to climb an ascent on the other side of about the same grade and extent as the one just passed. Reaching the top, they found a large chamber. The water dripped from the side and overhead, and disappeared through the crevices of the floor. There was quite a stiff breeze blowing, and they had to shield their candles with their hands, making progress necessarily quite slow. The floor was a brownish muck, which was very sticky.

Mr. Gilfillan started a little to the left of the party and kept walking towards one side of the room, when he suddenly stopped and exclaimed, "Great God, there sits a boy."

The rest of the party were soon at his side, and sure enough there did sit a boy or something human. The

head was resting on the knees and the arms were drawn around the lower legs, Indian fashion. At the side of the figure was another stone ax and a stone receptacle something like a bread bowl. The body was large and well developed, the muscles showing very plainly in all parts. Upon touching the body the sand and dust would crumble and run down the sides to the ground. In undertaking to lift him the arms came off at the joints and broke where the hands joined in front.

Where the bones joined the substance looked white, but the rest was of a blackish brown color and when touched would crumble and rub off like sand. The miners started to lift the body by the waist, but when just off the ground the legs came off at the hip-joint and fell over to the sides, when they separated at the knees.

They gathered up the pieces of their stone man and brought them to the surface without making any further exploration of the cave. The face is clearly formed, but the features are not plain on account of the crumbling away.

Mr. Donnelly took an arm and the lower part of one leg with him to Glenwood Springs and had it examined by several doctors, who were at a loss to explain the cause of the curious formation. To what age or race the strange dwarf belongs is also a mystery, but perhaps a further exploration of the cave may develop some discoveries that will throw some light on the matter.

A TREASURE CAVERN.

PREHISTORIC SKELETONS GARNISHED WITH GOLDEN NUGGETS—RELICS OF THE COPPER AGE.

Following is a dispatch from Helena, Montana, dated July 11, 1889:

The Belt Mountains have always been the seat of mysterious stories, and in their numerous gulches and canons have been picked up wonderful relics. Among the most curious are agatized human maxillaries and teeth, all of gigantic size. Gold in quantities has been found in the Belt Mountains, and rubies, sapphires and even diamonds are shown as products of one or the other portion of the territory. A gold hunter tells a remarkable story, accompanied by numerous attestations to its truth. While prospecting in the Belt Mountains he found a peculiar depres-

sion in the ground. After excavating, he discovered a mysterious cavern, reached by twenty-three steps.

"At the foot of the stairs," says he, "on one side of the passage, lay the skeleton of a man of immense stature. The skeleton measures exactly nine feet six inches in height. The skull lay a few inches from the trunk, and between the two lay twenty-seven nuggets. They were strung on a fine gold wire, and ranged from one ounce to ten in weight. Around the thigh, arm and shin bones were other strings of nuggets, none of which weighed more than four ounces. There were about fifteen pieces of gold in the pile. They were of many different shapes. None of them weighed over three ounces and each piece had a hole through the center. On each side of the skull I found some sort of precious stones. They lay in a tiny golden basket and were evidently worn in the ears as an ornament. I do not know what name to give them, but I believe that they are rubies.

"Beside the trunk of the skeleton I found a copper ax, with an edge harder and keener than any steel instrument of the kind I have ever seen. On the opposite side was a club made of the same metal as the ax. It was shaped not unlike a baseball bat. Under the trunk was a gold plate ten inches long, six inches wide, and one-eighth of an inch thick. It was covered with strange devices.

"A little farther on lay another skeleton, that of a woman. I picked up a string of nuggets near this skull also. They were perfectly round and exactly the same size. They weighed about three ounces apiece. Every now and then I came to other skeletons, and, although by nearly every one of them I found necklaces, yet strange to say they were made of round copper balls. The catacombs, as I have named this passage, are about 300 feet long, 14 feet wide and 30 feet high, and seems to have been cut out of the solid rock. At the end of the gallery is a room 60 feet square and 40 feet high. In the center of this room stands a block of granite about 12 feet square and 4 feet high. It seems as though the rock had been hewn around it. It is perfectly square, and it is exactly the same distance from the walls of the room on every side.

"There are steps cut in the rock leading to the top of the hall. On the top stands another block of granite, 10 feet long, 4 wide and 3 high. This is hollowed out in the shape of a human form. I lay down in this, and though I am not a small man by any means, yet the mould was much too large

for me. Around the room were scattered vessels of clay, some of which will hold twenty-five gallons. They are light, yet tougher than wrought iron. I tried to break one of them by dashing it against the granite flooring of the room. I could not even scratch it. Altogether I gathered up 500 ounces of gold in the underground passage.'

A PETRIFIED MISER.

DEATH FOUND HIM GRASPING HIS PRECIOUS POSSESSIONS
—DIAMONDS IN HIS HAND.

Following is a dispatch to the *San Francisco Examiner* from Kearney, Nebraska, dated August 6, 1889:

J. R. Mote, a farmer living in Phelps county, about twelve miles from Kearney, is in possession of a curiosity which is a valuable relic of prehistoric times in this part of the continent. Some time ago, while excavating for a cave, he exhumed a large brown stone weighing over twenty pounds. When the clay was removed from it a large fossil, representing a clenched human hand, was revealed. The specimen had been broken from the mammoth arm just above the wrist, and the imprint of a coarse cloth or some woven material was plainly outlined on the back of the hand. At the time of the discovery nothing was said of it, as Mr. Mote does not belong to the curious class of people.

For several months the specimen had lain about the house, and no one who saw it had any idea of the great amount of wealth held firmly in the grasp of the stony fingers. A small boy in the family, whose faculty for smashing things is just beginning to develop, conceived the idea of opening the hand. When broken, to his astonishment, there rolled out eleven brilliant transparent stones. The discovery of these beauties was not made public until yesterday, when Mr. Mote showed them to a jeweler, who pronounced them genuine first-water diamonds, without a speck or flaw to mar their beauty.

The jewels are nearly all uniform in size and are about the shape of Lima beans. They have the appearance of being water-worn, but are still beautiful stones. The possessor of this valuable find will dispose of the diamonds, and will at once begin his search in the old cave for the other hand as well as the rest of the body of this relic of an early age.

The mystery of the broken hand is one of perplexing interest. How long has it been there? To what race of giants did its owner belong? Was the subject an ancient miser, who died grasping his most precious possessions? and many other like questions are raised by the discovery, but to all of them the modern historian can only answer in remote and uncertain speculation.

A WONDERFUL FIND.

A HUMAN IMAGE IN BAKED CLAY FOUND THREE HUNDRED FEET BENEATH THE SURFACE.

In sinking the artesian well—which our friend Kurtz is interested in at Nampa, in this county—a few days since, at a depth of 310 feet, the sand pump brought up a well-formed human image in baked clay, two or three inches in length; perfect, save one foot was off at the ankle and the other just below the knee. We have not seen the wonderful find, but are told that it is really an artistic piece of work, the nose slightly worn, but the other features sharp and clear, and undoubtedly of burned clay. This seems to establish two facts; first, that the volcanic eruptions which at different periods have flowed over the plains between the Boise and Snake have aggregated a deposit of more than 300 feet; secondly, that previous to the earliest ages of that period this valley was occupied with human beings of sufficient civilization to make plastic images of the human form and bake the same into the imperishable article which has survived all these ages since. We imagine that there is great historic value and significance in this discovery at the bottom of the Nampa artesian well, and shall await with great interest the opinions of the savans.—*Boise City Statesman.*

JULES VERNE OUTDONE.

THE SECRETS OF THE EARTH REVEALED BY AN EARTHQUAKE—SUBTERRANEAN SIGHTS.

The party that went up to Rocky Canyon on Yulupa Mountain a week ago to investigate the phenomena following the recent earthquake, returned to-day. There were seven members of the party, which was headed by James Bordwell, the coal-burner, who first brought the news to El Verano of the strange actions of the waters in the old quicksilver mine in Rocky Canyon.

Yulupa Mountain lies about twenty miles northwest of El Verano, and it is the loftiest peak in the range of Sonoma Mountains. Its sides are very steep and rocky and are covered with a heavy growth of pine, redwood, manzanita and madrona, which, during the past two years, has been turned into charcoal by venturesome Americans, Italians and Portugese.

The trail up this mountain is sinuous and rough, it being absolutely impossible to get within five miles of Rocky Canyon on horseback or with any kind of conveyance. The coal-burners are obliged to carry the product of their pits to what they term a "lading" in sacks and long baskets hung at the end of poles resting across their shoulders, where it is taken in small and strongly-built wagons drawn by mules to the railway stations in the valley below.

The party of explorers went up this trail as far as possible in the saddle. After a weary climb of two days they left the horses in charge of an Indian boy that had accompanied them and started to cover the rest of the distance on foot. Each man carried a pack of provisions on his shoulders and a heavy stick in his hand, which answered the purpose of an alpenstock, and in many instances these staffs, armed with a sharp spike at one end, saved a man an unpleasant, and, perhaps a fatal, tumble down the side of the mountain.

It was a day and a night's journey from the horses to the coal pits, and the explorers labored up the trail without sleep, stopping only to unstrap their packs and lunch on the contents. It was a wild country, and three times was the progress of the party impeded by bears, which, in each instance were laid low with a bullet from the rifle of Bordwell, the guide. The nights on the mountain were made bright by the light of the moon, but the wild screams of mountain lions and the weird hoots of owls tended to keep the ghost of slumber from the eyelids of the explorers, who were men unborn and unused to the strange sounds of the mountain wilderness.

The coal pits of Bordwell were reached on the morning of the third day about 2 o'clock without accident to any member of the party excepting a broken finger that the *Examiner* correspondent got by falling down a steep declivity about twenty feet into a pile of jagged rocks. Bordwell's fellow-workman, whose leg had been broken by the boulder shaken loose by the earthquake that

crashed through the hut in which he was sleeping, was found to be suffering intense pain from the inflammation caused by the fracture. The sufferings of the poor fellow were lessened by Dr. Ordwell, a member of the party, who reduced the fracture and administered a soothing potion to the patient.

In the shadow of the smouldering coal-pits the wearied explorers threw themselves down, wrapped in their blankets, and for the first time since they left the horses, enjoyed sleep.

It was past 9 o'clock when Bordwell, who had risen with the sun, called the party up, and in ten minutes each man was washing a piece of broiled venison down his throat with a cup of delicious coffee prepared by a coal-burner, who had come over from the neighboring pits to remain with the man with the broken leg until Bordwell's return.

These coal pits were located on the north side of Rocky Canyon, which is a deep cut or defile in the side of the mountain, running from a narrow point near the top to the valley below, where it broadens out in the proportions of a narrow valley, rich in vegetation and valuable grazing ground for stock.

At the head of this canyon are several ever-flowing springs whose waters unite, forming a stream of considerable proportions that flows through the canyon into the valley, and at last debouches into Sonoma Creek. Near these springs, years ago, a party of Spanish prospectors discovered and worked a silver mine, only abandoning it when they had penetrated the mountain nearly 200 feet and were driven back by a resistless flow of water. For thirty years the shaft of this mine had stood full of water, until the recent earthquake, when it gushed out in a torrent, as described in a previous issue of the *Examiner*.

When the party of explorers visited the shaft on the morning of their arrival there were no indications that water had flowed from its mouth within the past twenty-four hours, as the earth was dry. From within the shaft came a murmur as of escaping steam in the distance; a sort of a muffled, protracted hiss, with now and then a swash like the slopping of waves against the face of a cliff on the seashore.

When the proposition was made that the shaft be explored but four of the party decided to enter it. These were Bordwell, the coal burner, Dr. Ordwell, Charles

Westover, a merchant, and the *Examiner* correspondent. The prospect was rather dubious, but the party had come a long way for the purpose of solving the mystery of the mine, and it would not do to turn back with simply having looked into the shaft; so enveloped in suits of rubber and armed with pikes, the party of four descended into the darkness of the shaft, each man carrying a lantern.

As the party advanced toward the bottom of the shaft the hissing and swashing became more apparent, and it at last became necessary for the members of the party to shout at the top of their voices while conversing in order to make themselves heard.

The floor or bottom of the shaft, which ran into the mountains at a decline of about forty-five degrees, was wet and covered with slime that had probably accumulated during the years that the water had stood in the shaft, and lizzards and mud-jumpers glided up the slippery walls when the light from the lanterns dissipated the darkness.

About 100 feet from the mouth of the shaft Dr. Ordwell struck his foot against something half buried in the mud, which, upon investigation, proved to be a portion of what was presumably once the jaw-bone of some gigantic animal. It measured ten inches and a half in length, and into it were set four cylindrical teeth, an inch and a half long. It was in a perfect state of preservation, and, from the way in which it was buried in the mud, it was undoubtedly driven outward from the bottom of the shaft by the waters as they rushed out. With this specimen carefully secured, the party moved on. Splendid specimens of petrified wood, some of them three feet long, were found scattered over the ground, and the putrefying bodies of a peculiarly shaped fish were found as the bottom of the shaft was neared. These fish were about thirteen inches long and flat, in many respects resembling the jointed body of the tapeworm. Their eyes were set in a broad, flat head and there were three fins on each side of the body between the head and the tail, which was long and thin, like the tail of a swallow. These fish were light in color and their bodies appeared to be transparent as the light was held near them. Their decaying bodies filled the shaft with an almost unbearable stench, and the party, with the lower part of their faces buried in their hands, hurried on. At the farther end of the shaft was found a

wide crevice extending from the bottom upward toward the top. This crevice was about six feet wide, and evidences indicated that the earthquake shock had rent the wall of the mine, and through this aperture had rushed the pent-up waters of a subterranean river until their force was spent. Through this crevice came the hissing and splashing sound, and carefully, on their hands and knees, through the mud the explorers crept through the seam, and sliding down a short decline, found themselves standing on a narrow ledge of rock that extended out into a torrent of water, the width of which could not be ascertained. Opposite this ledge a sharp spur of rock extended out of the darkness, and against this the water rushed, giving out the swashing sound that could be heard at the mouth of the shaft. Holding their lanterns aloft the explorers beheld a sight that brought an exclamation of surprise from every lip.

About fifteen feet above their heads hung the arched roof of the cavern or channel through which the water was rushing, and in the light of the lanterns it threw back a dazzling shower of coruscations. It was like a vast geode, the roof and sides being covered with a jagged crystallization blending the delicate tint of amethystine blue with the pure white of the pearl. In the glare of the lanterns the roof and walls flashed like the walls of a crystal palace. The water that came out of the darkness and rolled by at the feet of the party was of a whitish tint, and to the taste gave the impression that it was strongly impregnated with alkali. Hundreds of the strange fish seen in the shaft were attracted to the ledge by the light of the lantern, and their long bodies twisted like serpents as they held their own against the tide, and glared at the lanterns with their bulging eyes.

As the party moved slowly along the edge to the left it gradually widened. About seventy-five feet from the crevice through which the party had entered the cavern the river took a sudden turn and rushed with a loud roar over what appeared to be a spur of rock and down a steep declivity. Further investigation in this direction was prevented by a wall of rock that ran across the end of the ledge, evidently turning the water from its course. A strong draft of wind swept through the passage at intervals, threatening to extinguish the lights of the lanterns. The lanterns were held aloft at the end of the ledge, but nothing could be seen at this point but the most intense

darkness. The ledge on which the explorers stood was of a hard, flinty nature, and in it, at intervals of about five feet apart, appeared curious imprints as of the feet of some strange animal. As the party proceeded along the ledge to the right of the crevice it gradually grew narrower and the roof of the cavern descended so that it became necessary for the members of the party to stoop as they advanced, and after going in this direction about fifty feet the roof was so low and the ledge so narrow they were obliged to return.

The imprints in the ledge were closely studied and there were found to be two varieties. One was made up of three toes like that of a great bird, the middle toe measuring seven inches. The other impression was like the hand of a man in shape, but of enormous breadth, measuring eighteen inches across the palm. These imprints resemble those of the labyrinthodon, an antediluvian animal supposed by scientists to have resembled a huge frog.

After an hour's stay in the cavern the party came out and returned to the camp. The conclusion arrived at by those who visited the shaft is that there had been a subterranean reservoir beyond the end of the shaft for years, and that the earthquake rent the wall, giving liberty to the waters that flowed through the crevice into the shaft and down the canyon until the surplus was exhausted.

The same convulsion of the earth probably widened the bed of the river, and the river now flows steadily on from its source to its mouth, wherever they may be. It is evident from the formation of the cavern, the footprints and other indications that at some day in the past there has been a terrible upheaval of the earth at this point.—*San Francisco Examiner*.

EARTHQUAKE IN KIUSHU.

ONLY TWO HAVE TAKEN PLACE IN ONE HUNDRED AND ELEVEN YEARS.

The location of the earthquakes described below is very near the frigid zone which surrounded one of the former poles of the Earth, and is a result of that constant effort which centrifugal force is making to round out the present equator to a perfect circle. Its radial measurement lacks one mile of its proper length, and there will be no perma-

ment rest for the Earth in that region until this is accomplished. Following is a letter to the San Francisco *Examiner* from Yokohama, Japan, dated August 2, 1859:

It is just a little over a year ago that the terrible eruption of the mountain of Bandai (Japanese *Bandaizan*), which carried death and destruction over several square miles of the fair province of Twashiro, on the main island of Japan, aroused the sympathy of the entire world.

On the 28th of July the island of Kiushu, the southwesternmost of the four great islands forming the main portion of the Empire of Japan, was visited by the severest earthquake that has occurred in Japan since the great one which took place in Yeddo, now Tokio, in 1853.

The first vibrations were felt in Kumamoho, a mountain town situated in the province of Higo. The first shock was felt about 11:50 P. M. of the 28th, and was succeeded by shock after shock until 10 A. M. the following day. The earth literally opened its mouth, and large rents were made in the land, crushing houses that fell into the crevices as a nut is cracked in a nut-cracker.

The quake extended north into Chieugo Province, south into Hiuga Province and east into Bungo, altogether affecting an area of a little over seventy-five square miles. The whole district is exceedingly mountainous and difficult of access. Kumamoto is in the northern portion of Higo Province and is a place of great historical importance. Near to it is Aso Yama, an extinct, or at least a quiescent, volcano. This, however, does not seem to have exhibited any signs of disturbance, although some say that the mountain was visibly shaken, and distinct rumbling noises were heard. But Aso Yama is really the center of a chain of volcanic mountains, and Mount Kinpo, situated in the western portion of Kumamoto town, and which was the real center, as far as now can be ascertained, of the earthquake.

At 10 A. M. on Monday, the 29th day of July, there was a short truce, lasting some hours, but the tremors and shakings commenced again, with increased violence, and continued with short intervals up to 5 P. M. the following day, up to which time no less than fifty-three distinct, heavy shocks had been recorded, thirty-one houses had been demolished, fifteen persons crushed to death, about thirty seriously hurt, and no less than fifteen distinct crevasses in the earth were visible. This alone in Kumamoto,

The damage done in the other provinces has not yet been completely ascertained. From data now at hand the probable total loss of life will not exceed fifty, but the property loss will be very large, besides the immense number of people who will be rendered destitute through the loss of houses and crops.

On Wednesday, the 31st of July, the disturbance seems to have crossed the channel separating Kiushu from the island of Shikoku. Telegrams received here late last night state that the earth there is in a violent state of agitation, and that the province of Iyo has been badly shaken up. (Just as I penned the last sentence I experienced a momentary feeling—perhaps for the space of half a second—of sea-sickness. It was due to an earthquake wave felt in Yokohama, about 10:35 A. M., Japan standard time. The shock lasted about thirty seconds—course, south to north, not severe, but decidedly unpleasant.)

Hitherto the island of Kiushu has been comparatively free from severe earthquakes. The whole of Japan being of volcanic origin, of course no part has entirely escaped earth tremors and shocks, but very violent earthquakes, that is, such as cause fissures in the earth, and bring about destruction of life and property, occur only at rare intervals. It is 111 years (A. D. 1778) since Kiushu has thus suffered, and the visitation was confined entirely to the southern part of the province, but I have no data to fix the amount of damage or loss of life.

But unfortunately this earthquake is not the only calamity that this island has been visited with this year; nay, what I refer to occurred on the 8th and 9th of July, some twenty days before the seismic disturbance. The Province of Bungo has been terribly flooded and inundated. In one ken (ken is a division of a province somewhat similar to our county) 135 houses, 6,058 yards of embankment and about two miles of metaled road were destroyed, eleven bridges were carried away, ten persons killed, three drowned and thirteen received injuries more or less severe. In a second ken 983 houses, 1,200 yards of river embankment and eight miles of road were destroyed, several hundreds of acres of cultivated land damaged and ten bridges carried away. Eighteen persons were drowned, five more killed and seven others more or less severely injured. In two other kens of the same province damage to property has been enormous, with the loss of about thirty lives. All this damage was caused by the overflow of two

others are insignificant rivers, called the Kumagawa and Mamotagawa (*Gawa* is the Japanese for river.) The total loss, as estimated by government authorities, in this province will aggregate about \$400,000. But in contemplating this amount the American reader must not estimate from the American standard. Here in Japan a farmer who is worth a few hundred dollars over and above his land is wealthy. Consequently, multiply the sum given above by ten and then you will only have a moderate estimate of the damage had this terrible visitation come to a similar population in America.

ICE IN THE ROCKY MOUNTAINS.

FIRST DISCOVERY OF ICE ON THE SWEETWATER IN 1846 AND 1851—NO SOLUTION GIVEN.

The location mentioned in the following extract, taken from the *Oregonian*, was probably on the turning point parallel of latitude, (about 43° north, in Wyoming Territory) during the swaying of the Earth, and being on the Frigid Meridian, and the country filled with interior water, it was frozen to a great depth. There are other localities in like condition, and from a like cause:

Quite recently the world has been told that ice was discovered near the summit and west of the Rocky Mountains, bedded in the high plateaus of that region. Within the past six months the *Oregonian* has recited the fact that a company, of which the late Hiram Smith, of Portland, was captain, and of which E. N. Cooke and Elijah Williams, of Salem, all now deceased, were members, found such ice bedded in the mountain soil near the surface, on the Sweetwater river, in the summer of 1851.

Other and younger members of that company were T. McF. Patton, Joseph Cooke, Richard Williams, Major George Williams and Mrs. S. A. Clarke, who kept a diary of the journey, which she refers to and furnishes the following incident of the digging up of the ice. Mr. Smith (the red shirt Smith of pioneer times) had crossed the plains in 1846, and discovered, or was shown, this ice at that time. Probably old mountain men were along who knew of its existence, and showed him the deposit as they passed. Mr. Smith was a remarkable man, and never for-

got anything once known, so he had this place plainly in mind. Mrs. Clarke, though it was over thirty-eight years ago when she was young, remembers the spot perfectly. It was not an alkali region, but a mountain or foothill country, entirely free from all forest growth with a beautiful green sod shining in the summer air. They dug about two feet deep and dug out great blocks of it, and she then expressed the same idea that was recently reported as the impression of the last discoverers, that it was the remains of an old glacier. They found it twenty inches deep, and though it was nearly forty years ago, the ice remains embedded in the bosom of the mountain uplands.

Some years ago when she entertained John Muir, the naturalist, at her home, this lady responded to his tales of glaciers by telling of her long ago experience of finding ice in the midcontinent. He was asked for an opinion as to its formation, and especially if it could be from glacial action, but could offer no solution of the strange problem. In these parts hot springs are not singular, and why should we not be permitted to find ice furnished by nature as readily as boiling springs?

The passage from the diary of 1851 is as follows:

•• June 19, 1851.—Nine days after finding Sweetwater, we struck camp early, as we had sixteen miles of waterless desert to pass, though there is ice a little way off from the road. Large pieces of it were dug out only a few feet from the surface. It was quite free from impurities. It is a singular sight to see ice this hot day imbedded in nature's own laboratory. Can it be an old glacier? It was only a few steps from the road, and Mr. Smith remembered that when he crossed the plains in '46 they found it and made use of it, so he hunted for it and found it today."

The same journal, a few days later, has another remarkable paragraph concerning the existence of "tar springs," of which the ubiquitous "Red Shirt Smith" was also well informed when crossing the plains in 1846; for he had crossed the plains early and often before that. There is no doubt that this supposed "natural tar" was petroleum, and this shows that the recent discovery of oil in that region was only a refinding of what was long ago known to old mountain men and pioneers. The journal says, of date July 3:

•• Yesterday we passed near by the tar springs, so when the train nooned, we went out to visit them under the

guidance of Mr. Smith, who learned of them when crossing the plains before. It was about a quarter of a mile from the road the emigrants traveled. The teamsters filled their tar buckets. The substance found is much like the tar that is used for the wagons and it oozes out of the ground. If a hole is dug it soon fills up, and after it stands awhile the top is covered with a tar-like substance which is a scum of oily matter that has a queer pungent smell, but there is clear water underneath it. It is a curious deposit."

VOLCANIC RELICS.

CURIOUS NATURAL FORMATION TO BE SEEN IN NORTH-WESTERN NEW MEXICO.

If volcanos were outlets to a hollow globe filled with a molten mass of fire, simply engaged in the unique business of only cooling off, the "roots" of volcanos would not be found so near the Earth's surface, as shown in the following extract from the *Boston Transcript*:

During the past summer Captain C. E. Dutton, of the geological survey, has been studying some remarkable relics of ancient volcanic action in the northwestern portion of New Mexico. They consist of a multitude of needle-like peaks rising out of the broad valley bottoms to altitudes varying from 1,000 to 2,200 feet. They are called chimneys by the residents. They are composed of black basaltic lava, having a beautiful columnar structure like the basalt of the Giant's causeway. They are remnants of lava which once rose up out of the earth through the strata and congealed in the volcanic pipes or vents. In later periods the strata which inclosed them have been dissolved and removed by the general erosion of the country, leaving these basaltic cores projecting many hundreds of feet in the air, as casts of the volcanic pipes or passages through which the ancient towers rose to the surface. The proof of this origin is conclusive. Around the valleys in which they stand rise lofty tables or plateaus known in the west as mesas. These are capped with heavy sheets of basalt, and beneath them are the stratified sandstones and shales of the western coal fields. In the walls and upon the slopes of these mesas may be seen many of those chimneys in every stage of partial disinterment, some nearly

excavated, some half disintombed, and some just beginning to appear, as the mesa walls still have remnants of the old cinder cones upon their summits, while from those which are wholly or in the greatest part excavated all traces of the cinder cones have disappeared. Thus the veritable roots of the ancient volcanoes are unearthed and laid open to the inspection of the geologist. The locality where these volcanic "necks" (for this is the technical name given them by geologists) are seen lies along the eastern flank of Mount Taylor, one of the great extinct volcanoes of the west. It is about sixty miles west of Rio Grande, and seventy miles northwest of Albuquerque.

TAKE YOUR CHOICE.

In view of the fact that no "last man" will ever live upon the Earth to perish alone, the following "solutions" of "the fate" are rather amusing as specimens of ignorance run mad. The *St. Louis Republic* says:

What will be the fate of the last man is a subject that has often been discussed. There have been about a dozen different solutions to the question. Ten of the best are summarized below:

1. The surface of the earth is steadily diminishing, elevated regions being lowered and the seas are filling up. The land will at last be all submerged and the last man will be drowned.

2. The ice is gradually accumulating at the north pole and slowly melting away at the south, the consequences of which will be an awful catastrophe when the earth's corner of gravity suddenly changes. The last man will be killed by the crashing of movables or drowned by the torrents of water that will rush across the face of the land.

3. The earth cannot always escape collision with a comet, and when that disaster does come there will be a commingling of air and cometary gases which will cause a grand but awful and terrific explosion. If the last man has not already been suffocated he will be killed by the concussion.

4. There is a retarding medium in space, causing a gradual loss of velocity in the planets, and the earth, obeying the laws of gravitation, will get nearer and nearer to the sun, and the last man will, therefore, die of excessive heat.

5. The amount of water on the earth is slowly diminishing. Finally the earth will be an arid waste, like the moon, and the last man will die for want of water.

6. Other suns have disappeared, and ours must, sooner or later, blaze up and then go out forever. The intense heat at the time of blazing up will burn the earth thousands of feet deep; the last man will thus be literally roasted off the face of the earth.

7. The sun's fire will gradually burn out and the temperature will cool. The earth's glacial zones will enlarge, driving shivering humanity toward the equator, until the habitable space will lessen almost to nothing and overcrowded humanity will be frozen in a heap.

8. A gradual cooling of the earth's surface will produce enormous fissures in the outside crust like those seen on the moon. The remnant of humanity will take refuge in these great caves and the last man will be killed through some great convulsion of nature.

8. The earth will separate into small fragments and the last man will have a fearful ride as he falls through space forever.

10. The human family will retrograde until man will not possess a higher nature than the plant louse of to-day. Such being the case, this curious inhabitant will spontaneously produce posterity of both sexes, and when annihilation takes place it will be the closing act to the drama in which each has played his part.

ALASKA'S WONDER.

THE MUIR GLACIER, WHICH IS FORTY MILES LONG AND MOVES SIXTY FEET A DAY.

We have called attention in several previous issues of the *Trail* to this remarkable glacier, which is one of the most awe-inspiring of Nature's works in our farthest northern possessions, and is every year adding to its admiration of the grand, novel and beautiful—to this most attractive and interesting section of the globe. During the excursion season, tourist tickets are on sale over the Rock Island or Albert Lea routes and connecting lines, including steamship passage from San Francisco, Portland, Tacoma, Port Townsend or Seattle at exceedingly moderate round-trip rates.

The most notable of the glaciers in Alaska is called "The Muir," in honor of Prof. John Muir, the geologist, who gave to the world the first description of it. It is forty miles long, and back on the land, in a basin of the mountains. Being reinforced by fifteen tributaries coming down the glens from different points of the compass, it swells to an icy sea twenty-five miles in diameter. Thence it moves with resistless power, bearing rocks and long lines of detritus on its billowy surface. Just before it reaches the bay it is compressed by two sentinel mountains into and forced through a gorge one mile in width.

Emerging from this narrow gateway it moves on, at the rate of forty to sixty feet a day, to the waters whence it originally came, buttressing the bay with a perpendicular wall 800 feet high, 300 feet of ultramarine crystals tipped with purest white being above the surface, and, being pushed beyond its support in the underlying rock, a battle begins between cohesion and gravity. The latter force always prevails, and vast masses break from the glacial torrent with the combined crash of falling walls and heavy thunder, and tumble into the bay with a dash and a shock that agitates the waters miles away, making navigation perilous to crafts of all sizes. The almost deafening roar when these masses are rent away, the splashing baptism they receive in their fall, and the leaping waters are lively witnesses to the birth of an iceberg, which henceforth, as an independent existence, goes on its mission of girding the shores, butting against its fellows and of scaring navigators.

While the ship was resting unmoored near the front of this icy barrier (says Prof. Horace W. Briggs in the *Sitka Alaskan*), we were startled by the sudden appearance of a mass of dark crystal, vastly larger than our own ship, shooting up from the depths and tossing our steamer as if it were an eggshell. As the vessel careened, the frightened passengers were sent whirling against her, over chairs, or prostrate upon the deck. This strange visitor had doubtless been broken off from the roots of the icy mountain, hundreds of feet below the surface, and hence had unexpectedly appeared upon the scene. Had it struck the ship fairly, nothing but a miracle could have saved us.

Having recovered somewhat from our dumb amazement, about twenty of us were sent on shore in the captain's gig. Landing some distance below the ice wall, we climbed seventy feet up a lateral moraine, crawled shoe-deep in

wet gravel down into the valley of a glacial river, forded it, paddled through glacial mud covered with shingle just deep enough to hide the creamy pools, slipped prostrate on the ice made treacherous by a thin disguise of detritus, and barked our shins and cut our shoes on the sharp angular blocks of granite and basalt strewn for two miles in great profusion along our perilous route.

Blocks of the finest marble hedged our pathway; we trod on chips of jasper and chalcedony, the product of different mountains far up on the peninsula, and passed two exquisitely beautiful boulders of veined porphyry, weighing 200 or 300 pounds each, rounded and polished by centuries of attrition. They were of dark purple, streaked with quartz spotlessly white, very desirable specimens for a cabinet or for out-of-door ornamentation. After more than an hour of plunging and sprawling, and of pulling each other out of gray mire, about half of our number reached the uncovered glacier, and at the first glance we felt that here we should stand with uncovered heads, for we were in the presence of the marvelous manifestation of superhuman power in action, and looked with unveiled eyes upon the potent agencies by which much of this planet has been fashioned.

Away in the distance was the white lake fed by numerous frozen rivers, and these rivers were born of mountain snows fifty miles distant. The white-robed mountains themselves, æons in the past, were smoothed and grooved far up their flinty sides when this same glacier was three-fold deeper and many times more ponderous and mighty than it is to-day. Stretched along the base of the mountains till they were only a line in the distance were the record of those gray old years in the form of moraines 100 feet high, and appearing like a range of hills.

The larger portion of this crystal river, perhaps an eighth of a mile in width, is heaved into rounded hills and beetling precipices, quite resembling the sea in a storm; while the middle and much the wider part is splintered into countless spires and needles and pinnacles—ten, twenty, thirty feet in height, and of a beautiful ultramarine at the base shaded to a dead white at the summit. In the onward march of the glacier these pinnacles are occasionally wrenched from their seats in the solid ice beneath—they nod, then totter, and then make a plunge and are shattered into a cloud of acicular crystals that sparkle like the frosted snow under a full moon of a frosted night, only

with more of color; they are diamonds on the wing. Again the whole surface is riven by a thousand crevasses, along the bottom of which streams of clear water find their way, often broken by waterfalls that plunge farther down into the dark blue abysses out of sight. These chasms are frightful gaps to one peering down a hundred feet between their turquoise walls. A slip, a frail alpenstock, a feeble grasp of the guide's rope, and gravity would close the scene without further ceremony. The molecular structure of the glacier is continually changing, adjusting itself to the elevations and depressions of its rocky bed, and hence there is an incessant clicking and crackling, interrupted here and there by an explosion heard over every inch of the surface.

The whole scene is weird, and strange in sight and sound—in voices that rise to the air from the azure depths—fascinating because every step is perilous, majestic from its massiveness, and awful because its march is irresistible. Consider what force in wearing away mountains and glens an icy torrent must be, one mile wide, 800 feet deep, and in the middle flowing sixty feet a day; it goes grinding and groaning and crackling in startling explosions, all mingled in a loud wail like that from the Titans imprisoned under Mount *Ætna*.

Now, let any one in fancy frame for himself this picture: Snow-capped mountains in the background, two of them, Fairweather and Crillon, more than 15,000 feet high, thick set with glittering peaks and clear cut as silhouettes on a dark sky; the great glacier, child of arctic snows, turreted and pinnacled and splintered into a thousand strange forms upon which Iris has flung varied hues of amethyst and turquoise and sapphire; huge masses riven from the crystal river with a thundering roar, reeling and toppling into an amber sea, thickly dotted with new-born and vagrant icebergs; and all this scene glorified and transfigured by the setting sun. Looking upon this picture through the creative power of imagination, one can readily conceive that the enraptured tourist, standing in the presence of the realities, would call that day spent with the Muir glacier the day of all the days he ever passed in gazing upon and listening to the wild wonders of our planet.—*The Trail*.

THE SOUTH POLE.

SOME INTERESTING FACTS IN RELATION TO ANTARCTIC DISCOVERY.

The golden age of antarctic discovery arrived when Captain, afterward Sir James Ross, was dispatched from England in 1840 to fix the position of the south magnetic pole, and any other position he could discover on the way there. Before Ross could reach the scene of his labors other explorers, English, French and American, were busy forestalling him. Of these the first was the Englishman, Balleny, who, sailing in Enderby's ship, the *Eliza Scott*, discovered in 1839 the islands which bear his name, and which lie almost under the Antarctic circle and almost due south from New Zealand. Balleny could not land on the islands, but he made sure of their existence, and afterward, sailing far to the westward, he saw many more signs of land, and suspected the existence of much which he could not certainly vouch for. What Balleny thought he saw was probably much what the French expedition under Dumont d'Urville actually did see in the following year—several long lines of coast, which might be joined to one another, and might even run on to join Enderby Land in the west, and if so might certainly be part of the Antarctic continent that d'Urville was anxious to find. Not less anxious was Wilkes, the leader of the United States exploring expedition, who only a month after the Frenchman, arrived within a degree or two of the Antarctic circle, to the south of New Zealand, and, after seeing land, where Balleny had certainly seen it before, began to fancy that he saw it also where none had seen it before, and, unfortunately, where no one has seen it since. For some days, indeed, Wilkes doubted whether what he beheld were mountains of clouds, objects of which his crew watched eagerly to see if with the setting of the sun they would change their color. But after moving westward along the edge of the pack for a few days, he made sure that he now saw land, and somewhat inconsequently assumed it for certain that what he had seen before was land also. The discovery of an Antarctic continent was announced as a certainty; a very large land, with a barrier of ice before it, had a range of mountains upon it, was laid down on the map, and a copy of the map was handed by the rash but generous explorer to Ross, who left Tas-

mania in the autumn of the same year to look for the magnetic pole with the two ships Erebus and Terror, which afterward bore Sir John Franklin to his fate at the other end of the world. Ross had so little doubt that the Antarctic continent was discovered already that he seems to have been almost disappointed when his way to the magnetic pole was barred by an unknown land. Yet this land, which lay south of the seventieth parallel and eastward of Balleny's islands, was the most southerly hitherto seen in the world, and on it rose mountains thousands of feet high, plain and mountain alike robed in stainless snow, except on the cliffs by the shore, where the black rock came out. The coast ran almost due north and south, and along its eastern face Ross advanced steadily until he had beaten Cook's record, and also Weddell's, and gone further south than any before him. But he could find no landing place on the mainland, so choked was every inlet with snow and ice; only on a small island were the adventurers able to touch Antarctic earth, a few men among thousands of screaming and biting penguins. Fresh mountains came constantly into view as they moved southward; at last one in latitude 77° , over which a cloud of snow was blowing, but when they came nearer they saw that the cloud was smoke and gave the name of Mount Erebus to a giant volcano higher than Etna, which belches forth fire and smoke in a land where all things are frozen. Before Mount Erebus lies Cape Crozier, and round Cape Crozier Ross hoped to find a way to the westward, so as to reach the magnetic pole by the back of the new land he had found. But as they approached they saw stretching from Cape Crozier "as far as the eye could discern to the eastward" a "low white line," the nature of which they did not understand till they came close enough to see the truth with their eyes. It was a wall of ice 150 feet high, without break or slope, but one glittering, perpendicular steep, through which, as Ross said, one might as easily pass through the cliffs of Dover. Along this gleaming rampart Ross ran eastward for 250 miles, and in the succeeding year, 1842, for 200 miles more without coming to its end, on both of which occasions he reached the high altitude of 78° south, which has never since been approached by any man.—*Cassell's Family Magazine.*

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